

# University News

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**K.B. POWAR**

## **The AIU at Seventy Five**

**ANAND SARUP**

## **Towards a Research Policy for the AIU**

**J.S. RAJPUT**

## **Institutional Autonomy and NCTE**

**RAVIKALA KAMATH**

## **Dilemmas in Teaching Women's Studies to College Students**

**SHIKHA MISRA**

## **A Digital Text**

**—The Shape of Things to Come**

**S.V. KADVEKAR**

## **'Commerce' as Academic Discipline in Education**

**NASIB SINGH GILL & K.C. DABAS**

## **Challenges Before Information Society**

**U.R. RAO**

## **Towards an Egalitarian Society**

**—Convocation Address**



*Association of Indian Universities*



# UNIVERSITY OF DELHI

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### **M.Sc - Ph.D Combined and M.Sc Degree in Biomedical Sciences Beginning July, 1999**

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Twenty meritorious students will be awarded "Catch Them Young" fellowships provided by CSIR to ACBR @Rs.1500/- p.m. In addition, students may be awarded endowment fellowships like Prof. Gurbakhsh Singh Memorial Award, Prof. GBV Subramanian Award and Kala Ram Awards (five)

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**1. M.Sc - Ph.D Combined Degree in Biomedical Sciences (Full Time 4 Years Course) comprising areas like:** General Biomedical Science, Molecular Genetics, Tumor Biology, Medicinal Chemistry, Medical Biotechnology, Metabolic Pharmacology, Toxicology, Immunology, Radiation Biology, Natural Products and Indigenous Medicine, Structural Biology, Laboratory Medicine and Molecular Medicine.

**2. M.Sc Degree in Biomedical Sciences (Full Time 2 Years Course) :** comprising of areas outlined above.

**Eligibility (for 1 & 2) :** Bachelor's Degree in Biomedical Sciences / Life Sciences / Zoology / Botany / Microbiology / Bio-Chemistry / Chemistry / Environmental Biology / Biotechnology / Laboratory Techniques / B.Pharm / B.V. Sc. or M.B.B.S. with atleast 55% marks from University of Delhi or any other examination recognized by the University or equivalent thereto.

**3. Ph. D / M.Phil Degree in Biomedical Sciences**

Medicinal Chemistry, Biochemistry, Bio-Inorganic Chemistry, Bio-Organic Chemistry, Medical Biotechnology, Pharmaceuticals, Reproductive Biology, Developmental Biology, Molecular Genetics, Microbiology and Cell Biology, Chemistry and Biology of Heme, Tumor Biology, Immunology, Radiation Biology, Natural Products and Indigenous Medicine, Structural Biology, Laboratory Medicine, Metabolic Pharmacology, Toxicology etc.

**Eligibility :** Master's Degree in the appropriate field of Science, M.V. Sc., M. Pharma or M.D. with a minimum of 55% marks. CSIR-NET qualified candidates will be preferred.

**NOTE :** 15% of the seats are reserved for Scheduled Caste and 7.5% for Scheduled Tribe candidates as per University guidelines.

**How To Apply :** The Bulletin of Information cum Application form for all the above courses can be obtained from the Director, Dr. B.R. Ambedkar Center for Biomedical Research, University of Delhi, Delhi-110 007, by sending a bank draft of Rs. 630/- for General (Rs. 185/- for Scheduled Caste and Scheduled Tribe) categories made out in favour of the "Registrar, University of Delhi" drawn on State Bank of India, Service Branch (Code 7687) or may be collected in person from the office of Dr. B.R. Ambedkar Center for Biomedical Research, University of Delhi on all working days from 9.00 a.m. to 1.00 p.m. against Demand Draft of Rs. 600/- (for General) or Rs.150/- (for SC/ST). The request by mail must reach the office of the Director, on or before April 30<sup>th</sup>, 1999. The sale of bulletin will be closed on May 10<sup>th</sup>, 1999. The last date of receipt of completed application form at ACBR is May 15<sup>th</sup>, 1999.

**Admission Test :** Admission Test for M.Sc - Ph.D and M.Sc Degree Courses will be held on Sunday, June 6th, 1999 at 10.00 a.m. at the University of Delhi (North Campus). The candidates qualifying the admission test will be called for an interview and group discussion.

**Last Date of Receiving Completed Form : May 15<sup>th</sup>, 1999.**

**K.K. PANDA  
REGISTRAR**

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## IN THIS ISSUE

The AIU at Seventy Five	1
Towards a Research Policy for the AIU	3
Institutional Autonomy and NCTE	4
Dilemmas in Teaching Women's Studies to College Students	7
A Digital Text — The Shape of Things to Come	10
'Commerce' as Academic Discipline in Education	13
Challenges Before Information Society	17
Convocation	
Indian School of Mines, Dhanbad	25
Campus News	
Seminar on Human Rights	31
Chair in Indian Philosophy	33
Financing Education	34
Agriculture	
Agricultural Science Congress	37
News from UGC	
Countrywide Classroom Programme	39
Book Review	41
Theses of the Month	44
Classified Advertisement	52

Opinions expressed in the articles  
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SUTINDER SINGH



*From the Secretary General's Desk*

## The AIU at Seventy Five

On 23rd March, 1999 the Association of Indian Universities (AIU) enters its Platinum Jubilee Year. It was founded on 23rd March, 1925 when representatives of eleven of the then fourteen universities met in the library of the University of Bombay and formed themselves into the Inter-University Board (IUB). However, the genesis of IUB can be traced to the Calcutta University Commission (the Sadler Commission) which, in 1919, pointed out the need for coordination, between universities, in matters relating to courses of study and recognition of degrees. Subsequently, at a 'Conference of Indian Universities', held in 1924, a decision was taken at the initiative of the then Viceroy, Lord Reading, to establish a central coordination agency.

For an organisation of the nature of AIU seventy five years is a fairly long time. Over this period many similar bodies have first become ineffective and then simply faded away. In contrast IUB/AIU, in spite of setbacks and difficulties, has grown in strength and stature; especially after it was registered as a society under the Societies Registration Act in 1967; and adopted its present name, the Association of Indian Universities, in 1973. One would like to believe that the resilience of AIU reflects the confidence of the members in its ability to effectively pursue the Association's stated goals and objectives.

Today, AIU looks after the interest of all stakeholders in higher education. It presents to the government the viewpoint of the universities on crucial issues concerning higher education; helps the UGC and other statutory bodies in developing guidelines and procedures; brings together Vice Chancellors and Directors for discussions on university affairs; liaises with sister organisations abroad; organises training programmes, workshops and seminars for teachers and university administrators; organises sports and cultural events for the students, and provides information to lay persons on the system of higher education. The range of activities of AIU is certainly much wider than that of similar organisations like the Committee of Vice-Chancellors and Principals of UK or the Australian Vice-Chancellors Committee.

The advent into a platinum jubilee year is certainly an occasion for looking back — for savouring achievements and for pondering over failures. More importantly it is a moment for looking into the future. While doing so it is necessary to keep in view the fact that AIU is an organisation that does not have any statutory authority or financial powers. However, as Prof. S.S. Bhandarkar in his history of the Asso-

ciation has succinctly stated : "*Autonomous institutions established for the purpose of nurturing academic interests have a need of an equally autonomous representative organisation, unshackled by government control, for the interchange of ideas and for common action*". He has added "*Lack of official authority can be a positive advantage and in case of AIU it may be regarded as a definite necessity*."

It may be pointed out that before independence IUB played an important role in the establishment of the Medical Council of India and the Council for Scientific and Industrial Research. In 1952, it made out a strong case for the establishment of the University Grants Committee (later Commission). In the early years it played an important role in safeguarding the autonomy of universities. Over the years AIU has successfully organised meetings and roundtables of Vice-Chancellors that have yielded significant results. It has brought out important reports related to the functioning of universities. It has regularly published the 'Universities Handbook', handbooks on professional areas, bibliographies on doctoral dissertations, question banks and research publications. Its journal 'University News' has appeared with clockwork precision. A new series 'Selections from University News' has been introduced. The AIU conducts research on various aspects of higher education and has pioneered the examination reforms movement in India. It has made important research contributions on economics of higher education, and on quality assurance in higher education. The AIU provides service on equivalence of degrees, and on Indian educational programmes. For the students it organises inter-university sports tournaments and cultural events like the youth festivals. There is much more to be proud of. One may mention two achievements. First, the construction of AIU House with a library exclusively devoted to higher education, and a comfortable guest house. Second, the successful organisation, in 1991, of the Conference of Executive Heads of Commonwealth Universities.

Notwithstanding all these achievements, which do add up to a satisfying inventory of performance, we are conscious of our shortcomings and especially of the fact that in recent years we have not been able to adequately protect the autonomy of the universities. There are many problems that have persisted for long, especially those related to finance and quality. It is symptomatic of our times (and a little amus-

ing) that at the 1924 Conference of Indian Universities Lord Reading referred to the "*phenomenal increase in the number of universities*" (the number had doubled in a decade), and spoke about "*financial stringency*", and "*the right road to educational efficiency*". Further, that at the first meeting of IUB, in 1925, the items discussed included condition of service of university teachers (with special reference to rules of leave and pay), equivalence of examinations, and 'traffic in bogus degrees'. Surprisingly, in a century characterised by rapid changes, the basic problems of higher education not only persist but have increased in magnitude. These need the continued attention of AIU. Other problems that will probably continue to trouble us are those of access and equity.

What of the future? It is evident that AIU has to make changes, and alter gear, to meet the requirements of universities in a highly competitive knowledge-based society. The universities themselves have to modify their functioning in the light of paradigm shifts favouring student-centred learning and life-long education. They have to move towards a transparent, decentralised and participatory style of management. There has also to be a radical change in the relationships between colleges, universities, statutory bodies and government. Deregulation with greater autonomy, and correspondingly increased accountability, has to be encouraged.

The World Declaration on Higher Education, adopted at Paris last year, stresses that there is an unprecedented demand for, and a great diversification in, higher education. The concluding Article 17 calls for partnership and alliances amongst the stakeholders, and concludes; "*Henceforth partnership based on common interest, mutual respect and credibility should be a prime matrix for renewal of higher education*". Partnership and networking require coordination and cooperation — the *raison de etre* for the establishment of inter-university organisations. Clearly, the AIU has much work to do as a conceptualist, coordinator and catalyst.

We are chalking out activities for the Platinum Jubilee Year, and also planning programmes for the first decade of the third millennium. We shall be glad to receive your suggestions. We do hope that with the active cooperation of members and well-wishers we can make the Platinum Jubilee year a memorable one.

K.B. Powar

# Towards a Research Policy for the AIU

Anand Sarup

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**We are pleased to carry this note from Shri Anand Sarup, Hony. Consultant, UGC and former Secretary, Deptt. of Education, Ministry of Human Resource Development, Govt. of India, for wider dissemination and comment. AIU would welcome your views on the subject which may please be addressed to the Secretary General, Association of Indian Universities, AIU House, 16 Kotla Marg, New Delhi-110 002.**

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The research policy of AIU as indeed everything else the AIU does, flows from its nature as an organisation and from the challenges which face the universities in totality, or in groups, or occasionally even as individual entities.

In a pluralistic scenario, some seventy five years ago people functioning in the university system realised that it would not be healthy for the system if everything was left to be decided by the authorities. They took the view that the decisions and dictates of the government and its organs could not be accepted, passively and silently. As a result, the Inter-Universities Board, later the Association of Indian Universities (AIU) came into existence. Even though the Government of India and state governments, have played an important role, directly as well as indirectly, in the establishment and funding of the AIU, its *raison de etre* arises essentially from the universities' need for collective action for their well-being, 'as seen by members', and also for effective intervention to influence the policies and programmes of the governments and their authorities. Of course, the AIU has also to play a role in evolving ideas and programmes of action to deal with problems and opportunities arising from technological and societal changes.

This means that, apart from what has to be done to meet continuing commitments the agenda for action for the AIU should emerge from :

- a) what the government and its agencies want the universities to do;
- b) what the universities want the government and its agencies to do;
- c) what the universities need to do but cannot accomplish as individual entities within a very large system;
- d) the instances in which symptomatic problems are perceived in respect of the health and functioning of the system but the diagnosis and prescriptions in respect of these have to be evolved through research, deliberation and inter-action;
- e) new problems, challenges and/or opportunities which necessitate the working out of operational strategies to respond to these;
- f) the provision through joint initiatives of services and facilities which need to be provided to all the constituents in response to various situations; and, of course
- g) the information which needs to be provided to members, on a regular basis or on one time basis, through a competent bureau for data collection, documentation and dissemination.

Not all the items listed above as the basis for drawing up the agenda for action for the AIU require research. In

quite a few cases, the tasks to be undertaken would be in the nature of pooling together of information, reactions and problems and their presentation/dissemination either to the members or to various authorities and the government(s).

So far as research is concerned, before it is undertaken by the AIU, it should be asked as to whether a particular proposal is;

- (i) addressed to a specific and identified priority area of uncertainty or ignorance affecting the functioning of the universities; or
- (ii) concerned with the need for finding out as to how the university system should react to a policy initiative or a direction of the government(s) and/or one or more of its authorities; or
- (iii) relevant to the determination of a course of action, in order to respond to new developments in science and technology, the demands of expertise in the market place, or the aspirations of the clients of the universities; or
- (iv) the recurrent problems relevant to the management of the universities.

The criteria listed above are only indicative. Many other criteria can and should be added to these. Indeed, an important criterion would relate to the inherent responsibility of the AIU, as a "professional" body of constituent universities, to undertake self-evaluation as well as periodical re-definition of the normative parameters governing the universities so that the pre-conceived notions of the government, the 'authorities' as also of the universities would be tempered by the realities unfolding in this age of continuous change and organisational reorientation.

With regard to the research function, it has to be emphasised that it is not a routine or open-ended function. Every initiative in it should have a clearly stated purpose and a predetermined and clearly articulated methodology, and a beginning as well as an end point in time. Since research resources are (and will always be) limited, the programme of research should invariably be determined after a listing of needs and of priorities within the framework of resource constraints.

It is not essential that all the researches required by the AIU should necessarily be undertaken by the in-house staff. If the requirements of research are in excess of the potentials of the in-house organisation, some of the work can be contracted out, invariably after the parameters of such a study have been defined in detail by the AIU itself. Of course, the possibility of contracting out research should not become a routine excuse for the research personnel to escape their tasks and responsibilities.

# Institutional Autonomy and NCTE

J.S. Rajput\*

Universities symbolise the citadels of learning and scholarship and also of creation, preservation and transaction of knowledge. The haloed precincts of a university reflect the march of humanity towards celestial heights of values, cultures, traditions and an eternal quest for higher echelons of human life. Universities prepare leaders of the society and also the leaders of the nation. All these tasks can be performed only in an atmosphere of academic freedom. Their autonomy must, therefore, be ensured by the state and respected by the society.

After independence, the number of universities in India has grown substantially. This was necessary and desirable. During the last five decades several changes in subject structures, multi-disciplinarity and linkages between theoretical and practical aspects of various disciplines of learning have taken place. Everywhere breathtaking advances in information technology have opened new vistas in teaching, learning and researches. It has now become a cliché to speak of the world as a small global village. Universities are fast adapting the new techniques and technologies for the dissemination of information and knowledge to the ever increasing number of initial learners and those who want to augment their learning and renew their skills in the fields of their vocation and interest. Distance education and open learning are fast emerging as the most potential strategies available to learners of all ages and stages. Teachers could be real beneficiaries of these developments along with others.

## Teacher Preparation

With the rapid expansion of school education in developing countries, the need for large number of teachers has been felt acutely in the last five decades of the 20th century. Universal elementary education has become the need and necessity of every country which has not yet achieved this target. Educational policies, as such, focus on providing greater access to each and every child despite severe constraints of physical and financial resources. It was also felt necessary to train teachers of the requisite academic and professional competencies to manage the school and other learning centres. Whenever such professionally

trained manpower was not available, untrained and even underqualified teachers were appointed. This approach had a very strong logic and supportive rationale as a one time measure. However, no one was oblivious of the need to provide atleast some induction training to these new teachers as there were serious apprehensions concerning the quality of education in such situations.

In India several attempts were initiated in mid 60's to train the untrained serving teachers. One of the strategies implemented was launching of correspondence-cum-contact programmes leading to B.Ed degree by the National Council for Educational Research and Training (NCERT) through its four Regional Colleges of Education, presently known as Regional Institutes of Education. The NCERT model provided for training of serving teachers over a period of fourteen months which included contact programme during two summer vacations of two months each and ten months period of education through correspondence. This intervening period was also used for supervising practice teaching in identified schools by the student-teachers who already had sufficient teaching experience at their workplace but were required to deliver forty lessons after preparing proper lesson plans. While the quality of these programmes was appreciated the output was severely limited : only one thousand teachers per year graduated as there were only four regional colleges of education conducting these courses. There was a need for coverage on a larger scale. Universities accordingly stepped in and initiated programmes of correspondence courses leading to B.Ed degree for serving teachers.

## Concerns

Large scale expansion of existing institutions and establishment of new universities also resulted in ever increasing resource crunch. As a result, the universities were frantically looking for avenues for resource generation. Some of them hit upon the bright idea of utilising the correspondence course leading to B.Ed degree as a means of strengthening their economic conditions. Degrees became available to those who needed these and universities started generating resources, thus solving a major problem on their own. Some of the universities in this process admitted more than 30,000 graduates in one year and generated crores for the university. Universities, being autonomous entities, decided their own fee structures

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and other charges that would be levied on the student trainees, keen to get B.Ed degree. Their autonomous character also gave them freedom to conduct these courses regardless of the availability of sufficient regular faculty to manage large number of student teachers. The plain and simple argument was that part-time teachers shall be drawn to conduct these programmes. A large number of those invited to deliver lectures in these programmes, conduct contact programmes, act as paper setters and also as examiners of theory and practice teaching were benefited in terms of remuneration earned. Gradually the popularity of these courses increased countrywide. The provision of the eligibility condition of teaching experience of a certain number of years was silently given a go by. There are instances when the gap between admission and examination was reduced to a couple of months, if not a few days.

Several educationists and thinkers in the country were shocked and surprised that such ventures are being permitted which reduce the teacher training to a commodity being traded for generating resources. They were seriously concerned about the quality aspects and pleaded with the government to ensure that universities are persuaded to 'utilise' their autonomy to maintain quality in teacher education and the values for which the universities are known not only in Indian tradition but everywhere else. A large number of committees and commissions recommended the discontinuance of these courses. In 1984, the NCTE in its erstwhile status as a non-statutory body suggested that "immediate steps should be taken to get the correspondence courses for the first degree in teacher education stopped forthwith". The National Commission on Teachers—I, 1985, independently recommended that the first degree in teacher education should not be given through correspondence mode. The situation had become so grave that in 1987 a delegation of eminent educationists led by Dr. K.L. Shrimali, former Union Education Minister called on the then UGC Chairman to impress upon the urgent need to discontinue B.Ed through correspondence mode. The Ramamurti Committee in 1990 again recommended that the first degree in teacher education should not be given through correspondence education. UGC wrote to the universities in 1991 that there was no justification of continuation of correspondence course for B.Ed. It was also communicated to the universities that :

"The UGC had decided that the recommendations of NCTE require to be accepted that degree programme for B.Ed should be permissible in the formal system only through face to face teaching.

Correspondence courses should be used only for inservice, refresher training for teachers which would be in the nature of a short term course."

UGC again wrote to all the universities in 1992 not to continue correspondence programmes based merely on economic considerations. The CABE committee on Policy 1992 took a note of these instructions of the UGC. Taking a strong exception to the proliferation of sub-standard institutions, it reaffirmed that unless firm and effective steps were taken immediately to put an end to the commercialisation of teacher education, it would be futile to talk about educational standards. The NCTE expert committee, 1995, made the recommendation :

"that no further admissions should be made to courses of teacher education other than regular face-to-face institutional program of minimum one academic year duration from the academic session 1995-96 onwards".

However, these courses continued uninterrupted till the mid 90's. The issue of manpower planning or the need of trained teachers in specific areas or stages was never given any serious consideration by those responsible for conducting these courses. Universities themselves need to analyse as to why such strong and frequent recommendations were not accepted by them.

#### Consolidation

The NCTE Act was passed unanimously by both Houses of Parliament in December 1993. The Act came into force only in July, 1995. The statutory NCTE, with all the limitations of a newly born organisation, consulted senior teacher educators and educationists of the country and decided its priorities. The preamble of the NCTE Act gives a direction for such a formulation :

"An Act to provide for the establishment of a National Council for Teacher Education with a view to achieving planned and co-ordinated development of the teacher education system throughout the country, the regulation and proper maintenance of norms and standards in the teacher education system and for matters connected therewith".

The Act very clearly lists the functions assigned to NCTE. These are very comprehensive and practically cover all aspects of teacher education. Broadly speaking the NCTE has two-fold functions, regulatory and professional. On the regulatory side it has to ensure that planned and coordinated development of teacher education takes place with due consideration of manpower requirements. Towards this end, NCTE has prescribed norms and standards to be fol-

lowed by all institutions recognised for awarding teacher education qualifications for teachers from pre-school stage to secondary stage. On the professional side NCTE is supposed to provide academic and professional assistance to teachers and teacher educators through surveys, studies, researches and innovations at pre-service as well as at inservice stages. NCTE began work on both these aspects and on 3rd November 1995 in the first meeting of the General Body of the NCTE, norms and standards for pre-primary, elementary and secondary stages of teacher education institutions including those for B.Ed through correspondence and distance education mode were approved. These were notified to all the institutions individually, through state education departments and through public notifications in press and media. As per provisions of the Act all institutions including university departments were supposed to get their programmes leading to teacher qualifications approved by the Regional Committees of the NCTE which are located at Bhopal, Bhubaneswar, Bangalore and Jaipur. Any new institution was to be opened only after the concerned NCTE regional committee had examined the proposals and found the concerned organisation capable of running good quality teacher education programme.

#### **Collaboration**

NCTE followed a policy of generating awareness and persuading institutions and state governments by elaborating the benefits of ensuring minimum standards and norms in teacher training institutions. That the approach succeeded is evident by the fact that by December 1998, 1155 teacher training institutions of elementary stage and 842 institutions of secondary stage have approached the regional committees of NCTE to approve their programmes. The regional committees of NCTE took a supportive view and wherever deficiencies were found, reasonable time was given to take corrective action. Initiatives of the NCTE have resulted in appointment of more teacher educators, better libraries, more equipment and more working days in a large number of teacher training institutions.

On the regulatory side the guiding principle before the NCTE has been one of the listed functions in the Act, 'take all necessary steps to prevent commercialisation of teacher education'. NCTE suggested to all the universities that fees charged from the student-teachers have to be reasonable and at least 95% of the amount collected should be spent on the programme side. It was also pointed out that universities were not justified in charging fees from the students and constructing buildings of other depart-

ments or running other institutions. A meeting was held in the University Grants Commission on 5th June, 1996 in which seventeen Vice-Chancellors representing universities conducting correspondence courses leading to B.Ed degree were present. They had their reservations, apprehensions and also considerable anguish if not anger. In this meeting the Chairperson UGC made it very clear that NCTE's norms are now binding and these will have to be followed by every university. In fact the norms for correspondence and distance education courses which the NCTE had circulated in the month of December 1995 had already been circulated earlier in September 1995 to all the universities by the UGC itself. The Vice-Chancellors present there were advised to skip one academic session if they needed more time to develop the necessary infrastructure to conduct correspondence course as per NCTE norms.

Some of the open universities decided to interpret the NCTE Act by stating that their B.Ed distance education course did not fall within the purview of the NCTE. Being a major policy issue, it was examined legally and the decision was taken by the Ministry of Human Resource Development in which NCTE's primacy as an apex body in all aspects of teacher education was accepted by all concerned. It was also decided that while granting recognition to the teacher education programme conducted by the open universities, due consideration would be given to the views of Distance Education Council (DEC) of IGNOU which is also a statutory body and has the necessary expertise in the field for conducting distance education programmes. The issue was amicably settled.

NCTE has come in the field of teacher education as a new body which genuinely intends to perform its functions assigned to it by the Parliament of the country. It has made its humble contribution in focussing and highlighting the worth and value of teacher education. Teachers will have to be professionals and their training programmes must be characterised by appropriate duration, extended interaction and sufficient rigour. Teacher education institutions need to follow a value based approach to education and not an economic agenda. NCTE has to monitor and assess the progress and identify the problems in teacher education. NCTE has received tremendous support and goodwill from established national level institutions like UGC, NCERT, NIEPA, AIU and also from the teacher educators and educationists of the country and from the majority of the universities and state governments. Its regulatory functions are very much similar to those of AICTE,

*(Contd. on page 9)*



# Dilemmas in Teaching Women's Studies to College Students

Ravikala Kamath\*

## The Scenario

The challenge of teaching Women's Studies begins with the initiation to the discipline/field/subject — (words currently used interchangeably in the academic circles to describe the upcoming domain of Women's/Feminist Studies). The matter seems so clear, often close to the heart, easy to grasp and convey — as a result there seems no reason to expect that the classroom teaching of the same would pose any difficulties. In fact, it warrants nothing more than the routine task. The complacency is short lived; for soon it begins to dawn on the teacher that one's depth of expertise and scholarship is shallow, and that systemic constraints and prejudices need to be removed. The problematic concerns that confront me as a women's studies' teacher can be subsumed under three main focii : (i) the target group — the young beneficiaries of college students; (ii) the pedagogical approach of women's studies that must essentially be different and yet fit into the prevailing educational system to remain receptively viable; and (iii) the larger reality of an existing gap between practice and precept.

In an attempt to find substantiation (or otherwise) for the problems that are faced, a concerted literature survey was made with suitable key words (to the best of common knowledge) for the computer search and while a large number of titles did emerge, the data was more related to statistical figures of composition, enrolment, male-female composition in faculty positions and less on teaching-learning dilemmas/issues. Therefore, without the assurance of other documented sources, I present my personal experiences on how and why I find myself at the crossroads of rethinking and searching for new directions and supportive help.

## Teacher Profiles

The 'teaching-learning-teaching' cycle of experience with women's studies has been for me (and I am sure, for many other teachers like me) an additional adjunct to my main field or specialisation and training in child development within the umbrella

of Home Science. I make this point here to delineate the profile of some, if not all teachers currently 'teaching' women's studies/concerns/issues in colleges in India : they have all had to 'add on' this subject focus to their prevailing repertoire of academic interests and thrusts within their specialisation, be it psychology, literature, sociology or any other science or social science stream in most cases, such orientations have been self-taught, either by dint of self-motivated interest and zeal, or environmentally stimulated and sustained, but more often compulsorily indulged in because of the dictates of the mandatory computation for workload of college teachers. The teacher-inputs and preparatory set and induction and the scholarship itself is, therefore, liable to be restricted and limited in terms of time span, intensity and extensity, depth and conceptual clarity. The absence of any good role model of committed teacher (or teaching citadel) to emulate may be yet again another constraint. The issues discussed in this paper must be, therefore, examined in the light of this picture of an average typical teacher of women's/feminist studies in colleges that at present offer courses at different levels and within different framework of orientations.

## Areas of Concern and the Emerging Dilemmas

The target group of students, the beneficiaries of these programmes, the predominantly young girls are in the range of 18-25 years. It has been my experience that while the orientation to women's issues leads to substantial awareness and development of insights on the part of students, there is a burden of conflict also for them — conflict stemming from their socialisation experiences, from the parental and societal pressures to conform. One finds that as intelligent discussions are entered into doubts are clarified and thinking rechannelised, within the security of the classrooms, the girls (surprisingly significant numbers) emerge as constructively analytical self expressive and critical evaluators within the college premises. But they also become less fit in the traditional families to which they belong, to the conformist parents to whom they owe allegiance (often expected to be translated into absolute obedience). The constructivist strategies of action and negotiation that have been learned (or are being cultivated and beginning to blossom) are squashed with a sweeping

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blow of parental dominance, adamant orthodoxy. When the thereby crushed and confused student returns to the teacher, who sowed the seeds of independent analysis in her, there is no real support system or social network that be mobilised forthwith to assist the candidate on a holistic basis. I find that as a teacher I can sustain intellectual discussions with élan, monitor debates and enumerate coping mechanisms with conviction but to help specific students with their real life problems, I feel less equipped and even less confident. Do I have the time, energy and the requisite liaisons? Which activist agency/group will suit her needs best? Is the teacher-student relationship a mentor-protege relationship? With reference to the other subjects I teach, I am aware of the limits and boundaries of my relationship with the student, but when it comes to the topic of women's issues, there is truly confusion.

At the other extreme, is a contradictory trend among the youth, particularly girls, in whom a kind of 'inertia' or 'apathy' or more aptly a 'learned helplessness' inhibits any pro-active attempt for change. Any activist effort or intervention or even the motivation for change is conspicuous by its absence. Academic exercises are indulged in, may be there is positive acceptance at the theoretical level, but actually even small efforts to initiate any change are seldom initiated. What can be done to change them? To what limits? In what direction? (A feeble voice inside me asks at time, "are they better off as they are"?) I recall that some time back, reviewing the objectives of a course outline (syllabus) at the postgraduate level, we discussed and ruled that one of the professed objective of 'motivating students to work for the improvement of the conditions of women' was too broad and ambiguous to be measured and less concrete to be realised. What then is the basic and underlying thrust of this whole exercise or pursuit if not to go beyond 'changing the ways in which women are perceived to changing the way women perceive themselves, think and behave' (?) What are the immediate goals and objectives of the academic course if some perceptible action does not ensure?

The second area of concern surfaces from the inherent nature of the discipline and the feminist pedagogy itself. The pedagogical controversy stems from the years of the educational impress and routines wherein the students are 'en masse' silent/passive listeners to 'lectures' in the classrooms. Any teaching methodology short of this is not viewed seriously enough, is not seen as 'academic learning' or exercise meriting higher level thought or reading. Departures from conventional teaching methods, from the

familiar examination-orientation are often trivialised. Typically feminist pedagogy seeks to empower students by sharing knowledge, role and power, the goal being to build collaborative systems (Fisher 1987). Feminist professors must see their role more as consultants or clarifiers than as a typical authoritative information givers (Omolode 1987). Essentially, cooperative learning using a democratic process is the norm that capitalises on integrating personal experiences, subjective knowledge and affective reactions so as to enable students to analyse situations more effectively. Therefore, keeping lecturing to a minimum and using interactive-participatory approach in the classroom makes for successful and popular climate for expression but I fear that many students see the sessions as 'interesting' and 'enjoyable' and devoid of the 'academic' fervour. Further, library reading on the topic is seen as 'boring', printed matter on the topic is perceived as 'too dry' or 'tough to digest'. Arpad (1994), an American professor deputed to teach in Hungary endorses the same, "...although they (students in Hungary) valued the classroom atmosphere throughout the semester, students, frequently mentioned that somehow the class did not seem to be really academic because of all the discussion. Discussion by the students rather than lecturing by the teacher made the information less intellectual and more emotional."

Next arises the question of 'marks' to be assigned for the subject on the mark sheet. When the typical subject examinations (2-3 hours written examination papers) are held, the purpose of the course seemed defeated by the examination fear. The alternative internal continuous assessment (internal assessment marks) can be applied. Even so, the question arises "how" (and why) to quantify with/without evaluative judgement attached, the students' proficiency(?) and scholarship(?) and achievement(?) in women's studies? — By the garrulousness at the discussion? By the volume of personal experiences undergone/shared? By the verbal skills and commitment displayed at activist interventive analysis of women's issues? How to rate/measure/quantify/ — but quantify we must, since some grade point, or percentage calculation on the mark sheet is essential. What then is to be done? Is it a meaningful exercise to assign some evaluative criteria for learning on women's studies? If not, will it appear meaningful enough at all? ...The dilemma of how to fit women's studies into the framework of the prevailing educational system needs to be addressed urgently and imperatively.

Last but not least, the hiatus between theory and practice, the absence of a tangible interface and the

remote possibility of bridging the gap effectively, makes teaching of the subject a slow frustrating process that encroaches into the motivation and commitment of the teacher on the one hand and signals the failure on the part of the student to accept the precepts with conviction. I tend to agree with Lacey (1977) who identified three stages of beginning teachers' adjustment to teaching : *Stage 1* — internalised adjustment at which there is a general acceptance of prevailing patterns of behaviour as appropriate; *Stage 2* — strategic compliance, novice adjusts to norms but maintains reservations, and *Stage 3* — strategic redefinitions by which the new teacher actively works to change the set of role expectations. I acknowledge that I have now reached at the transition from stage 2 to stage 3. I have laid bare my reservations and am seeking to derive those redefinitions which are needed to avoid or arrest the slow erosion into the commitment and conviction of new women's studies teaching fraternity.

### Conclusion

Cooperative efforts of like-minded professionals, activists and academicians must indeed positively emerge. The group bound together by the goal of advocacy for women must work to create an ethos of sustained hope of change and impact beyond 'small mercies' or minor ripples. The vital seeds of conviction must be sown in the minds of the teacher and the taught emerging from tangible answers to problematic issues of teaching women's studies in the regular higher education system as it is operates today, failing which the jeopardy of women's studies becoming yet another bookish-exam-oriented subject at one extreme or a trivialised — marginally-condescendingly tolerated female domain at the other extreme will be the most threatening outcome. Collective wisdom, sustained effort and active networking on a sustained basis that will influence thinking and behaviour is vital and timely to strengthen the strides hitherto made to initiate inclusion of the study of women's issues and perspectives in colleges and overcome the obstacles that threaten further progress.

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## Institutional Autonomy and NCTE

(Contd. from page 6)

Medical Council and Bar Council. Gradually its role is being understood and appreciated.

The Supreme Court of India in its judgement on 15th June 1993 has highlighted the desirable approach to matters related to teacher training.

"Training in a properly organised and equipped training institute is essential before a candidate becomes qualified to receive teachers training certificate. Simply passing the examination is not enough. The future teachers of the country must pass through the institutions which have maintained standards of excellence at all levels."

It also quoted from earlier judgements.

"The Teachers Training Institutes are meant to teach children of impressionable age and we cannot let loose on the innocent and unwary children, teachers who have not received proper and adequate training. True, they will be required to pass the examination, but they may not be enough. Training for a certain minimum period in a properly organised and equipped Training Institute is probably essential before a teacher may be duly launched."

The NCTE is doing its best to discharge its statutory responsibility of achieving planned and coordinated development of teacher education programmes keeping in view the manpower requirements of various stages of education. It is also providing academic, professional and other inputs for the qualitative development of teacher education institutions. The performance of this onerous task cannot be undertaken without active, sustained and willing cooperation of all educational institutions, particularly the universities. The NCTE has no intention of transcending its mandatory responsibilities and transgressing the autonomy of the universities, which it considers, is vital for the flowering of the intellect and extension of the frontiers of knowledge.

# A Digital Text

## The Shape of Things to Come

Shikha Misra\*

John Wiley and Sons, the internationally reputed publishers of texts for professionals in technical fields have claimed that in the coming months two of their important reference books — *The Kirk Othmer Encyclopedia of Chemical Technology* and *The Wiley Encyclopedia of Electrical and Electronics Engineering* — will be available on line. Japanese scientists are working on a vending machine to distribute digital magazines. These could be downloaded on a cassette and read with the help of a special pocket sized device. At Virginia Commonwealth University in New York, a prescribed text of sociology exists only on line. The UK Open University has recently signed an agreement with the Electronic Data Interchange Company from Malaysia whereby on line courses will be directly administered to students in that country. In Texas the State Board of Education is planning to distribute electronic books to high school students. The UK, in one of the largest programmes of its kind, is to spend 75 million pounds to fund 76 projects located within its higher education institutions. It is targeting the development of teaching and learning programmes by using communication technology.

These and other such examples prove that electronic communication is rapidly becoming a familiar feature of life today. Advocates of the printed page may decry the notion of a paperless society, but with two electronic book devices already in the market and increasing amounts of data available on line the days of the Book seem to be numbered.

### A Brief Survey

Electronic digital application, such as we know it today is the culmination of a step which may roughly be dated back to the 1940s and World War II. During the War computers were developed to help military establishments in ballistic calculation, in military logistics and later in atomic physics. Computer technology was subsequently applied to research areas like computation of mathematical functions and resolving difficult problems in engineering. Commercial use of digital computers was first made by the aircraft industry and later by insurance companies.

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Computers in higher education were first employed for research in applied mathematics, engineering science and astronomy during the 1950s. The 1960s saw computer based methodology employed in the Social Sciences. The introduction of data base technology in the 1970s, while extending its use to other disciplines, helped make computers more cost effective. Computer Aided Instruction (CAI) has been successfully applied to disciplines as varied as language and literature, biblical and religious studies, archaeology and history, as well as to teaching of ancient languages like Sanskrit, Greek, Latin, Egyptian and Sumerian. Marshall McLuhan rightly called the computer a prosthesis in the assistance of human intelligence. A remarkable modern tool it is indeed a powerful aid in the field of mental endeavour.

The ongoing shift from Gutenberg to new modes of communication has left its mark on the universities especially in humanities since they are text centered studies and the culture of laboratories and computers is alien to them. That Digital electronic transmission has become an important means of communication cannot be denied. Network systems today provide facilities for electronic mail, easy access to databases, as well as opportunities for discussions and conferences with colleagues from all over the world. It would not come amiss therefore to familiarize oneself with some *commonly used terms* in electronic communication systems such as hypertext, document assembly, multimedia and software innovations.

*Hypertext Systems* link different parts of a work so that one can jump around the same work and also in and out of other work as the need arises. It opens up a world in which it is possible to work with all books always present to one another and to us. We can acquire detailed information on one point, refer back to a previous document, compare with a third and then switch back to the main argument again.

*Document Assembly* is a technique which enables work to be carried out in pre-determined formats like order forms, invoices, application forms etc. All relevant forms are available on file and can be used as and when desired. Facts entered in the forms at one point may be used to fill in the forms automatically at any other point. Thus a curriculum vitae entered once will appear on all forms as required without further

processing. This technique has been used successfully in the field of business and legal practice.

*Multi Media*, as its name suggests, combines the use of diverse media. Thus a topic can be explored through text, video, music, graphics and other relevant modes. It can either be joined into one unit through use of hypertext or viewed sequentially. This method lends itself with great success to the study of visual arts, music and plays.

*Software innovations* allow for both hypertext systems and multi media presentations viewing. Windows displays have been developed where screens can be enlarged or diminished to make room for others involving text or other media.

Two *major advantages* of digitalization are demassification and interconnectivity :

*Demassification* : Once texts and images are converted into digital form they shed huge amounts of mass. The entire contents of the Oxford English Dictionary can be conveniently stored on two thin CD-ROMs. Reading is not affected as the typeface can be limitlessly enlarged. It has furthermore been predicted that the ratio of data to matter will increase dramatically in the coming years. When this materializes libraries need never worry about storage space nor need parents fret about the size of children's school bags.

*Interconnectivity* : Storage of texts, images, sounds on electronic systems opens up unprecedented possibilities in higher education. Link ups with databases becomes possible throughout the country, and also internationally, thus leading to drastic cuts in inter-library loan expenditure. Scholars, through Internet and World Wide Web (WWW) can collect information at incredible speed from user sites across the globe.

A *major feature* of the electronic age is that key nomenclatures are being recast. Traditional definitions for traditional institutions like the book, the author, the editor, the publisher, the reader are undergoing rapid redefinition. Thus in the work centres of the National Library of France (Bibliothèque Nationale de France) readers are being redefined in terms of the reading they practise (long term versus short term readers). Earlier categories of social (learned and popular), political (public and private) or economic (fee paying and non-fee paying) are no longer valid.

*Sundry problems* which can be visualized in the process of electronic digitalization are :

- *The Problem of unaccountability* : The printed book imposed limits to acquiring a text and modify-

ing it; a costly book had to be shared or borrowed and it was considered unethical to cut up or mark someone else's copy. But with the advent of the electronic revolution all such considerations are passé. Writing no longer retains its fixity. Without fixity signification becomes uncertain. Books can be infinitely reduced and modified without any guarantee that the purity of a text will be maintained. The spectre of irresponsibility looms large where neither writers nor readers will be accountable to the other.

- *The Problem of Control* : All control is removed from the hands of the originators of file contents. Interference is difficult to detect since it can occur at the speed of light without leaving behind any traces in the original document. An agreement therefore will have to be devised for the protection of copyright in a situation where virtually no control seems possible.

- *Monetary Considerations* :

- [a] *Writers and Publishers* : Publishers are motivated solely by the wish to make money. Authors need money but they also want recognition. A pre-requisite of recognition is a wide readership. Thus begins a clash between authors who want a wider dissemination of text and publishers who do little to encourage use without payment building barriers to deny access.

- [b] *Users* : When a work is written primarily for information it needs to be used. Publishers claim that users must pay. Users do pay in the sense that they use the information received as starting points in their own work thus adding to the corpus of existing information. But publishers feel cheated.

- *Economic Viability* : Publishers claim that the single most important factor behind escalating prices of the book is the spiralling cost of paper. Due to the scarcity of trees paper has become expensive and printing on paper is now a costly venture. Digitalization will usher in a paperless society but it will require substitute materials. Instead of paper, cloth and glue, says Paul Duguid of the Xerox Palo Alto Research Centre, USA, plastic, wire and glass fibre will be required. Again, conversion of documents into electronic media will be an expensive exercise. Initial investment in installation of access services and infrastructure will be heavy. Conservation and maintenance cost will be high. Therefore what is envisaged is a shift in expenditure rather than a real reduction in cost.



- **Security Systems** : Computer criminals, virus producers, saboteurs and hackers pose grave threats. Academic work is virtually accessible world wide. No effective copyright laws exist. Banking systems especially financial transactions need to be protected. Access detection systems are still expensive. Encryption or coding the actual text and having a decoder at the other end is not only a complicated process but is prohibitively costly.
- **Modes of Textuality** : Digitalization holds out the promise of a limitless expansion of knowledge and our ability to access it but it ushers in a new mode of textuality different from that of the printed text. Whereas the digital text is a matter of immediate and continuous apprehension the book is a more leisurely and slower form of expression. It is, as Marcel Proust has said, a fulcrum that creates space out of time. It gives us time to investigate, reflect and contemplate and is a rather slow and tedious path to knowledge and action. But the tedium is necessary for, as experts point out, the issues facing humanity are too complex and too fraught with potential danger to be fully understood or to be acted upon instantaneously. The dangers inherent in accelerated on line communication hence cannot be disregarded.
- **The Validity of Human Experience** : The need to preserve the validity of human experience becomes the duty of every human being. In the electronic world human experiences threaten to be reduced to the status of a pure memory flow of an on line exchange. Besides, certain tools and standards to maintain the integrity of textual and visual forms will have to be devised. The survival of the original form will have to be ensured at all times.

### The Indian Scene

Electronic digitalization is still a fanciful unreality for the majority in a country like India. Equipment is still too expensive, software scarce and power supplies irregular. Lack of spare parts and components often makes it easier to replace than to repair. The ERNET, a computer networking project, set up as a joint venture between the United Nations Development Programme and the Department of Electronics in 1986, is still beyond the reach of the masses. The total number of computers in India is comparatively small. Government statistics claim that there is one computer per thousand in this country. The Department of Electronics is targeting a penetration of one in hundred in the coming four to five years.

Moreover, a social backlash cannot be ruled out. Electronics as a networking system contains within

itself the unpleasant potential of widening polarities between the rich and poor thus exacerbating social tensions. Unhealthy feelings of inadequacy, deprivation and exclusion may become the bane of a large section of the population. As it is, lack of infrastructure and a very real paucity of funds has reduced networks to a distant dream for the majority of educational institutions. As and when computers become the main medium of instruction poorer children will always lose out.

### Conclusion

The electronic digital revolution of the past 30 years has produced radical changes in the very concept of communications technology and what once seemed to be the stuff of dreams has emerged as a virtual reality. Computer scientists, engineers, publishers, technocrats are achieving considerable success in their efforts to convert communications infrastructure into digital form. The book, the classroom, the old methods of scholarly seminars and workshops could all be replaced by on line correspondence courses. The library could well make way for the on line forum. The day may not be far, says Jeff Rothenborg, senior computer scientist with the Rand Corp, when printed books on paper may be viewed more as objects *d'art* than things we use all the time. In the next millennium the Book could very likely cease to be the principal vehicle of knowledge. A luxury market of printed books may still exist for the very rich but for most of us the faster and cheaper electronics will be more viable. Perhaps, in this period of the *fin de siecle* we already are living through the last days of the Book.

If so, a fascinating new epoch of experimentation and innovation lies ahead of us. Even we in India — once the initial infrastructure is installed and available to all — may become active participants in a universe where all knowledge is (at least potentially) continuously present at all times to everyone. It is a beautiful dream to hold on to as we enter the new millennium.

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# 'Commerce' as Academic Discipline in Education

S.V. Kadvekar\*

## Introduction

The history of Indian education is a picture of both light and shade, of some outstanding achievements alongwith many outstanding failures. It has given us a high level trained manpower whose size is largest in the world and top levels of which are comparable to those of leading countries in the world. It is this manpower which now provides the key personnel in all walks of our national life and also enables us to help several other countries. However, it is the opinion of the UGC that the education system has developed 3 major weaknesses :

(1) It continues to be dominated by models and value systems of colonial times, therefore it has proved itself inadequate to meet our national needs and aspirations.

(2) The system maintains double standard, there are few institutions of good quality having selective access. The majority of the people including weaker sections receive their education in rest of the large number of institutions. This dualism leads to undesirable social segregation and inequalities.

(3) Even in quantitative terms, it is mainly the upper and middle classes that are beneficiaries of this system. Sixty per cent of population which is still illiterate has obviously received none of its benefits. Of every 100 children of six years of age 20 never go to school, 55 drop out at an early stage, so that only about 25 complete class VIII, 70 per cent of the seats in secondary schools and 80 per cent of the seats in higher education are taken by the top 30 per cent of income groups.

The UGC has suggested the following major reforms to overcome these weaknesses :

(1) To transform the basic structure and processes of the system, to make it dynamic and flexible and to move in the direction of providing opportunities for life long learning to every individual;

(2) The work and education to be linked closely (education linked to productivity);

(3) The education system to assist socio-economic transformation and participation in programmes of

such transformation, education system becoming a medium of education itself. The measures suggested include following :

(a) The elementary and secondary education should cover 12 years, so that secondary education can prepare for entry into work at a large variety of skilled levels and also send up more mature and better prepared students to the university.

(b) The curriculum of secondary schools should be revised. Work experience, social service, and vocationalisation should become integral parts. This will establish linkages between education and productivity.

(c) The university system itself will have to play a leading role in bringing about the transformation of the existing educational system into a new system suited to our needs and aspirations involving a major socio-economic reform.

## 'Commerce' Discipline and the System of Education

It is interesting to study the place of Commerce education in the total system of education. According to Committee on Commerce Education appointed in 1961, the Commerce education began in India as early as 1886 when the first Commercial School was started in Madras by the trustees of Pachiappas Charities and round about the same time, the then Govt. of Madras instituted examinations in Commerce. Govt. of India started a School of Commerce in Calicut in 1895.

In 1903 Commerce classes were started in the Presidency College, Calcutta. Between 1903 and 1912 commercial institutions were also started in Bombay and Delhi and provision was made for training in typewriting, shorthand, letter writing, business methods etc.

The Commerce education at the collegiate and the university level began with the establishment of the Sydenham College of Commerce and Economics in Bombay in 1913. The subsequent years saw the spread of Commerce education both at the school and collegiate levels all over the country. The overall picture of Commerce education and training in India is summarised in Table 1.

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**Table 1 : Commerce Education and Training in India.**

Sr. No	Type of Education	Institutions/Medium
(1)	Professional education (Accountancy, Company Secretary, Cost Accountancy)	Specialised Institutions at All India level. Admission is open to B.Sc., B.E. or any other graduate in addition to B.Com.
(2)	Degree, Diploma Courses (After 10+2 stage) B.Com, M.Com, M.B.A. etc.	Universities
(3)	Higher secondary/vocational education (After 10th std. +2 stage)	Jr. Colleges/Higher Secondary Schools.

From the above it can be seen that Commerce discipline enters the system of general education at higher secondary level. Considering all India rate of educational dropouts Commerce discipline gets introduced only to 5 or 10 per cent of the students admitted through total system of education.

### Problems and Issues

The commercial sciences thus have failed to come up as a systematised body of knowledge into the national education system. There may be many reasons for this situation. The analysis must start from the role played by the national level professional bodies. The institutions like I.C.A., I.C.W.A., I.C.S., I.I.Ms etc have their own limitations. Their views are too much specialised. These bodies have failed to develop Commerce as an academic discipline due to following reasons :

(a) Typical cadrisation of business education by the professional bodies — professional/non professional, craze for imitation etc. These bodies nurture professional interests only.

(b) The professional institutes are mainly examining bodies — ICWA, ICA, ICS etc. They do very little in monitoring the total education system in Commerce.

(c) Management institutes are dominated by consultants rather than teachers. They fail to take overall view of the discipline as an instrument of education.

(d) The professionals coming out of certification process of the Institutes have their own limitations over the academicians or educators. A 'professional' works as an agent or mouth-piece of the retaining organisation. A member of the Association may not always consider social, ethical and rational aspects of the function.

(e) The programmes of continuing education and training are necessary for achieving professional excellence. The so called professional associations have

done very little in this field. Instead some of the bodies have started their own foundation courses for students coming out of +2 stage. They have also discontinued the practice of giving exemption from some of courses of studies for B.Com./M.Com. degree holders.

(f) The professional bodies, Trade Associations/ Chambers of Commerce have shown very little inclination to associate universities in designing or re-designing the Commerce courses. It is learnt that on many occasions such organisations have criticised the university system and discouraged the university authorities from doing something new in restructuring of Commerce courses.

These points lead us to the conclusion that it is university level Commerce education system which is responsible for nurturing and transforming the Commerce discipline. The university and college teachers, students, commerce colleges and institutions etc have to play effective role in this endeavour. An effort is made here to understand this role and to help chalk out the strategies accordingly.

The universities are the centres for professional and social transformation. The aim of university is to remain centre of culture. Therefore, the commerce academicians at the university level must guide the educationists and national/state level councils of education and research on the changing role of Commerce discipline in education. It is also the responsibility of professional associations/examining bodies to consult university academics while developing their programmes of training and education.

### Commerce Education Process

It is very interesting to understand the nature and process of education in Commerce. 'Commerce' can be explained as a socio-behavioural science; which studies business as a human activity and human behaviour in the conduct of business activities. The knowledge of business process, practices and performance goes at the root of human civilisation. This knowledge seeks to comprehend at the conceptual level the intellectual understanding and at the concrete level generating operational knowledge for proficiency in performance.

It is not a positive science. It deals with live consciousness of human beings which can be understood only by studying internal consciousness of the people, which is expressed in terms of intentions, attitudes and motivation. It uses knowledge viz. knowledge to use knowledge by way of order, system speed and method. It is thus a modern applied discipline developed into an independent body of knowledge.

It is interesting to understand this with the help of Figure 1 :

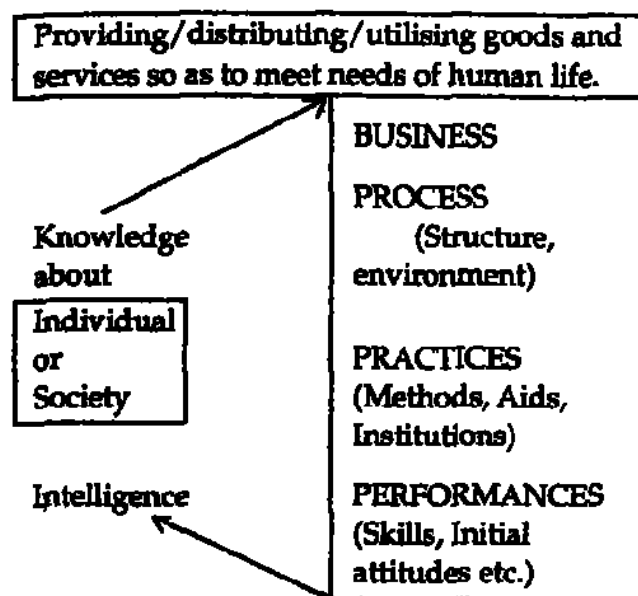


Figure 1 : Commerce Education Process

It can be seen from Figure 1 that :

(a) Business is a human activity. It exists and expands through generations as per aims and aspirations of the human beings. The mechanism and systems are also creations of the society.

(b) The Individuals, as a component of the social system plays pivotal role both at providing as well as receiving points.

(c) The individuals' interactions with business are conditioned by their perceptions, interests and abilities.

(d) The knowledge and intelligence form an integral part in strengthening the role of individual or society.

(e) Rate of growth of business is tremendous.

(f) The non technical operations have become important than technical in production. This is because of consumer awareness and increased marketing outlook.

(g) Globalisation or internationalism has led to competition, productivity, quality consciousness on one hand and there is a fear of malpractices, unethical trends and unfair business practices etc on the other.

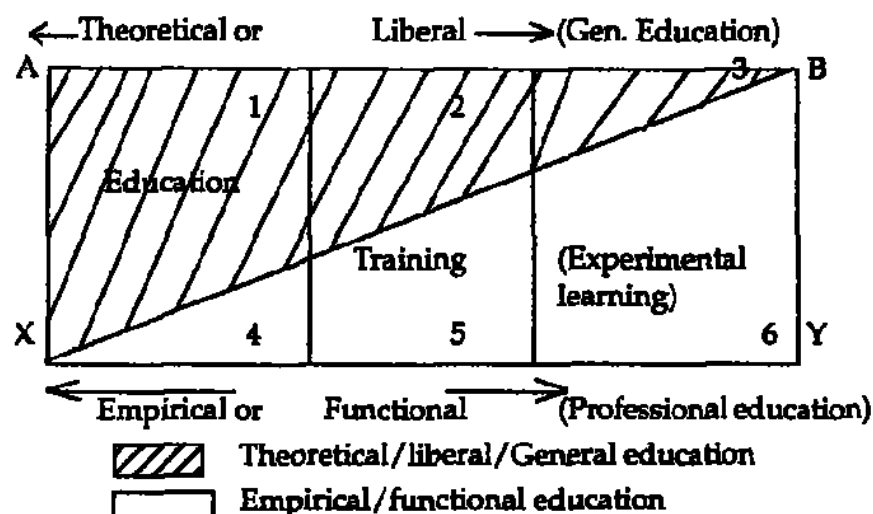
(h) There is an emergence of consumerism, and that business decisions are being heavily influenced and directed by consumers/society at large.

(i) External controls and govt. regulations are going to be absent which necessitates self regulation, internal control and professionalism. They require proper education and training base.

#### Knowledge Component of Commerce Discipline

Education is a medium through which knowledge and intelligence required by individual or soci-

ety can be obtained or properly formulated. In view of multi dimensional and applied nature of the Commerce discipline the knowledge component is multifaceted cutting across liberal and functional lines. This is illustrated in Figure 2.



Area A - 1 - x 4 represents educational stage of individuals in the age group 10 to 16

Area 1 - 2 - 4 - 5 represents educational stage of individuals in the age group 17 and above.

Figure 2 : Knowledge Component of Commerce Discipline.

It can be seen from Figure 2 that :

(1) The Commerce education is both a liberal or general on one hand and at the same time empirical or functional on the other. The liberal or general aspect of Commerce education is directed to the development of intellectual activities, values and attitudes of the individual or society, while empirical or functional character of Commerce education enhances functional abilities or skills and help individual and society to perform.

(2) The uniqueness about Commerce discipline is that its liberal or general component emanates from empirical or functional component. Any subject area of Commerce discipline would prove this point. The conceptualisation and statement of theory of market, stock exchange, wholeselling, joint stock company etc have developed through years on the basis of practices and conventions all over the world. The example of 'Super Market' in merchandising activity originally started in US got spread throughout Asia, Africa and European countries. It firmly got rooted in theory of Commerce. The liberal component of Commerce is not in absolute or abstract terms as in other disciplines but it is based on the cross fertilisation of practical ideas. The theory of Commerce in true sense of the term, is nothing but practices universalised.

(3) Thus commercial practices, forms, ideas and conventions have got universalised in local actions. The thinking and interpretations at the points of action have formed into theoretical base of Commerce.

When it comes to education, Commerce therefore begins with functional aspect and then leads to liberal or ideological aspect. The individual and the society get goods and services delivered at the doorsteps for their consumption. For seeking truth behind this one has to take up Commerce education. The availability of products and services at all times is necessary for the economy and for the society. The survival of life is dependent on this availability. Naturally the Commerce system touches every part of human life, and Commerce education becomes an education for living. Commerce education has a role to play in every system of education, at every stage of education, and in every form of education.

The contribution of various disciplines to the human knowledge and understanding can be further illustrated with help of Table 2.

**Table 2 : The Universe of Knowledge**

<i>Knowledge and Understanding of things around the Individual and society</i>	<i>Body of knowledge or Discipline seeking knowledge</i>
— Self	Humanities, Behavioural Sciences
— Institutions and Organisations	Social Sciences
— Nature and matter	Physical and Exact Sciences
— Products and services at the doorsteps	Commercial Sciences, Technology

The knowledge and understanding of products and services at the doorsteps can be obtained by the society through study of Commercial sciences.

The study of Commerce at appropriate stages while in education leads to grounding of personality as an 'economic man', the individual as contributor to wealth, a resource; as well as a person who shares wealth. In effect the functional utility of an individual and society at large increases. A well conceived general education in Commerce may result into development of some positive traits or values listed below :

- Result or performance orientation;
- Innovativeness through entry of new products and services in the society;
- The responsible consumerhood — society becoming more informed about products and services before consumption and use;
- Recognition of money as a resource or store of value rather than means of wealth creation;
- Investment approach leads to habits of planning, forecasting, rational thinking;
- Accountability due to knowledge of analytical tools; and

- Increased awareness about quality of life.

### **Contribution of Different Subject Areas**

It is quite interesting to study how commercial subjects included in education have led to the development of positive values and attitudes.

The Accountancy as a subject has ceased to be a matter of book keeping and preparation of balance sheet. It now has its place in general information theory. The equation of accountancy  $Dr = Cr$  takes us to the principle of accountability. The subjects like Commercial Practices have led us to understand the business process and practice, environment, general commercial knowledge etc. The subjects like Laws relating to business have their roots in policy studies, principle of natural justice, public administration and legal environment etc.

The subjects like Business Administration, Entrepreneurship, Finance etc have also derived their thoughts from creativity, innovativeness.

### **Conclusion**

The knowledge component of Commerce is fast expanding and diversifying. As social culture shifts from ideal to material, commerce education has started moving from abstract thinking to thoughtful action, perceptions and practices gaining prominence. In view of changes in the objectives of education the Commerce discipline should enter the system of general education right from secondary stage. As far India is concerned, commercial sciences must find their place in higher education specially to achieve following goals of education.

- Development of total integrated personality of the student;
- Commitment to society through involvement in development programmes and actions;
- Application of new methods of science and technology effectively in industry and agriculture;
- Improving productivity of human efforts towards improving quality of life; and
- Entrepreneurisation of the society.

We in India are passing through stress and strains both in socio-economic as well as on political fronts. The Herculean task of transforming the tradition bound society into a modern society will not be completed without balanced programme of education. It is only through universalisation of Commerce education that the transformation of society can take place.



# Challenges Before Information Society

Nasib Singh Gill\*

K.C. Dabas\*\*

## Introduction

In the present competitive era, Information is being treated as the 6th and most important resource in addition to the most traditional resources namely Man, Machine, Money, Material and Time. A single technology has dominated each of the past centuries. While the 18th century was the time of great mechanical systems accompanying the Industrial Revolution, the 19th century was the age of Steam Engine. During the 20th century, the key technology has been Information Technology. That's why it is essential to develop the appropriate information infrastructure and make major investment in the field of Information Technology which in turn forms the Information Society (IS) of Tomorrow i.e. 21st Century. The advancement of Information Technology (IT) has changed the society and also posed a challenge to the information system professionals to meet the increasing demand for information.

## Information Society

Industrial revolution changed our society from an agricultural society to an industrial society. Now, computer is changing the industrial society to an information society. The Internet in future will change our society from information society to a global society. The human society is undergoing a sea change due to phenomenal growth of information and application of IT in the form of high degree of computerisation and transmission of electronic information. The new information society combines both continuity and fundamental change. The core tenet of the information society is the utilisation and exploitation of information for development.

In the information society of the present day, not only a huge amount of information is produced but also tremendous developments in the computer hardware and communication technology along with the necessary software tools have made possible the quick retrieval of the desired information merely on the pressing of a button. The significant indicators of the information society are as given below :

- Right access to right information at the right time
- Introduction of computers and telecommunication technologies in dealing with information
- Information rather than the capital as a strategic resource base
- Growth of infrastructural backbone for IT applications
- Shift in occupational structure from manufacturing to information based activities.

## The Challenges

Today's information society is passing through various challenges due to lack of 1. Information Professional's Skills, 2. Information Management Skills, and 3. Up-to-date Subject Knowledge.

## Information Professional's Skills

The information society definitely lacks in the information professional skills. Few of these skills are

- Identification of user's information needs
- Analysis and anticipation of user and organisational information needs
- Presentation, editorial and publication skills
- Ability to organise and store information for effective retrieval
- Training, education and consultancy skills
- Knowledge delivery mechanisms
- Ability to add value to information
- Methods of disseminating information
- Awareness of technology skills and subject expertise
- Knowledge of disparate information resources and how to access/integrate them
- Familiarity with research methods
- Ability to evaluate information
- Knowledge management
- Knowledge of legal, economic and political aspects of information.

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## **Information Management Skills**

Information is considered the most important resource and that's why in the context of decision making, information is also treated as the blood of management. In the absence of awareness regarding various kinds of management, the information manager can't enjoy the right benefit of the right information in the undertaken stage of decision making. So, management skills are required by information professional at various stages of the information cycle. Few of these skills which are of utmost importance include :

- Understanding the organisational culture
- Project management
- Change management
- Strategic planning
- Financial management
- Human resource management
- Communication skills
- Marketing skills
- Vision and creativity
- Liaison and negotiating skills.

## **Up-to-date Subject Knowledge**

An information professional must keep one of his eyes at present and another at future. He should not be confined to his subject but in the light of technological innovations, availability of better software development tools, better techniques of communication etc must update himself. So, an information professional needs the following :

- Present trends and developments in hardware, software and communication technologies
- Information exploration and visualisation
- Means of preservation for information
- Internet and its efficient use for quick access of desired kind of information
- Technology for intellectual property protection.

## **Changed Roles of Information Managers**

Information should remain information rather than mis-information. Wrong information may have its own negative impact which may damage the entire plan or strategy. It is the responsibility of an in-

formation manager to create a useful link between the user and the information. In the events when information is mishandled or poorly presented, it loses its value and the same may cause negative effects on the emotions of its users. In order to overcome such a situation, the information managers have to :

- Analyse the user's needs from time to time
- Regular and constant watch on the information flow within the enterprise
- Analyse the information seeking behaviour
- Help the user in learning the techniques for efficient retrieval of information
- Make the appropriate use of information in a suitable situation
- Be aware of the consequences of the misuse of the information and its impact
- To strike a balance between the existing needs and changed needs of the system
- To take necessary steps to implement the expected changes maintaining a balance between supporting and opposing forces
- To evaluating systems and procedures from time to time
- To review policies from time to time in the light of emerging trends.

Information management is not an easy task, rather it is a very cumbersome task. Information managers have not to be confined to their single subject but a good information manager must have the awareness of the following :

- Training on information management
- Functions of information management
- Information policy
- Information systems
- Information technology
- Areas of application
- Economics of information
- Information use and users
- Information marketing.

There are very large chances of misusing information which may further cause very erroneous and awkward decisions. Attempts should be made to minimise the misuse and abuse of information. Few

specific suggestions to avoid misuse and abuse of information within an enterprise are :

- Emphasis on developing system standards
- Evolving an effective information policy
- Employing timely provision of service for avoiding delays
- Evolving effective bibliographic control devices
- Developing a good organisational environment
- Co-ordinated relations with the users
- Re-orienting users from time to time
- Training of users in the latest tools used for information retrieval
- Building up ethics in the users
- Constant review of the procedures
- Educating means of information maintenance.

### **Strategies for Survival**

In the present information age, we must adopt appropriate techniques for storing, manipulating, disseminating the desired information by means of efficient retrieval mechanisms. Our basic principle of reference service would be "Right information for the right user at the right time in the right form" This principle demands the following :

- Awareness of users
- Users' needs
- Users' background
- Users' preferences and purposes.

The development of human resources in the profession of library and information science needs to be looked into from two aspects : Development of existing professionals, and Developing potential professionals.

Information centres and libraries have been managing information since their inception, but the information centres and libraries of today, are faced with the information explosion. The information explosion had led following two types of fears :

**Digital Library :** Information society is gradually heading for a paperless society in which information will be available only in digital form on computer-based internal and

external memory or storage devices, and therefore, books are destined to perish.

**Absence of Books :** The words 'libraries' and 'books' go together to such an extent that a dreaded question arises 'Whether the libraries survive if the books become extinct?'

India has a tremendous potential in software development. It must amend its policies for information dissemination from time to time in the light of technological innovations, changed users' needs, etc. The following strategies are suggested for survival in the information age :

#### **1. Information Service Committee**

An Information Service Committee must be established, which must be assigned to perform the following tasks :

- Drawing up the standards and labour division for database design
- Drawing up network plans and laying technical standards
- Identifying appropriate software and popularising their application nation-wide
- Determining standards and protocols for parallel effort in the labour division and co-operation for document acquisition and resource sharing and database contribution
- Establishing the national on-line cataloguing centre.

#### **2. Holding Mechanisms of Documents and Database Design**

We must improve utilisation rate of purchased documents, enhance professional characteristics of document collections and electronic publications, co-ordinate document acquisition and speed up the construction of databases, laying a foundation for document resources sharing.

#### **3. Digital and Virtual Libraries**

Digital libraries may provide networks of high quality information, while virtual libraries may share the information resources of the world, which may help in attaining innovative ideas in the respective fields.

#### **4. Surveys on Users' Needs**

A thorough investigation of users' needs is sought so that the design of appropriate information products can be accomplished so as to extend better

information service. Users' needs are mainly felt in Decision making, Scientific research needs, Market needs, and Social needs.

#### 5. *Training of Networking Personnel*

With growing usage of networks all over the world, it is essential to train Information Scientists and its Networking Personnel in cultivating innovative ideas, competence, knowledge structure and technological level so that it can fit with the users' needs of Internet growth. Therefore, libraries and information centres should make the training of networking personnel an important agenda. It should be of professional background with foreign language, computer networking knowledge and retrieval skills. The training standards and effect should be defined and taken into consideration, so as to establish an environment oriented to help most of them to adapt themselves to the development networking.

#### 6. *Increase the Fund Input*

The automation and networking in libraries and information centre as well as the exploitation and utilisation of information resources requires a huge investment. For this purpose, an increase in fund is required to compete with the rest of the world.

#### 7. *Multimedia-based Information Systems*

Tremendous developments are taking place in the design of storage mediums, in microprocessor development and communication technologies which have enabled multimedia information to be stored and distributed over networks. Multimedia is being employed for instructional purpose in developed countries and at many other places in the developing countries. The multimedia also helps in distance education. Internet, multimedia and web plays an important role in distance education. Object-oriented design philosophy has also proved one of the very good design paradigms. So, information systems can be built around an object oriented distributed architecture with special design features. Designing a distributed multimedia information system is a very complex task. An object-oriented distributed multimedia information system is desired to exhibit the following properties :

1. *Portability* : The system should be portable on a wide cross-section of operating systems and computer architectures easily.
2. *Flexibility* : The system should support dynamic selection and modification of appropriate algorithms/mechanisms used to implement distributed object services.

3. *Distributed Transparency* : The location of the distributed objects should be transparent to the application designer or user of the multimedia information system.
4. *Interoperability* : Any object should be able to invoke another object without knowing the details of its implementation.

#### **Making IS of 21st Century a Grand Success**

The task of building a sound Information Society of 21st Century a grand success and to resolve the challenges posed by such a society is really a very difficult task. This task will take into account lot many factors and a few important of these are : Information Infrastructure, Role of Development Agencies, Proper Information Policy, and Intellectual Property Rights.

#### *Information Infrastructure*

Infrastructure is the main component of every system which hereafter credits a big success of system implementation. The same is also applicable in case of Information Systems. Information infrastructure is made up of the networks of telecommunications and the tools of computing, in addition to organisations, libraries/information centres and similar other set-ups. As its sole purpose is to transport, manipulate store and disseminate information efficiently, it has become the 'knowledge tool' essential for the management of the economy. And because economic development is about knowledge, the developments in communication technologies hold inestimable promise for people in the developing world.

Information users' satisfaction is of utmost priority. To determine future demand of infrastructure, it is essential to consider the efficiency of operations and how well the services generated are responding to users. There are diverse and unique problems for each sector and some of the common challenges of information infrastructure development in India are :

- Operational inefficiencies
- Lack of adequate maintenance
- Excessive dependence on public and external resources
- Lack of responsiveness to user needs
- Meagre benefits to the poor and lack of sufficient environmental responsibility.

The set of options or alternative approaches before India are as follows (World Development Report on Infrastructural Development 1994).

- Efficiency in operation performance
- Promotion of competitive markets in infrastructure services
- Institutional capacity to manage sectoral policies and to regulate infrastructural services
- Replacing the monopolistic nature in infrastructure by a competitive environment
- Applying commercial principles of operation
- Involving users in product designing and operation of infrastructure activities. It has the real advantage of decentralisation and participation involving users; and finally leads to user involvement in decision making.

#### *Role of Development Agencies*

It is essential for development agencies to come forward for offering their assistance in the respective areas. Many development agencies like World Bank, FAO, IDRC, IFAD etc are assisting with the expansion of indigenously managed Internet services in developing countries. Internet is not a panacea for removal of constraints to rural development. But it brings all new information resources together and can certainly open new telecommunication channels to rural communities. It offers certain ways of bridging the gaps between development community and rural people through initiating dialogue, interaction, new alliances, interpersonal networks and cross-sectoral links between organisations. FAO development agency had the following programmes to :

- Promote communication for the sake of rural development
- Liberalise telecommunication policies in the developing countries
- Promote policy and regional co-ordination of Internet strategy for rural development
- Establish rural development and Internet pilot projects
- Assist rural and agriculture educational sector Internet capability
- Provide Internet awareness through proper demonstration
- Support local Internet entrepreneurs and other service providers in developing countries

- Advocate for Internet service provision and telecommunication infrastructure
- Suggest Internet policy improvements
- Support rural and remote infrastructure development
- Assist creative Internet applications and information services for rural development.

#### *Proper Information Policy*

There must be an ordinance of governance for every scheme/plan. On the same lines, we also have ordinance of governance for 'Information' as a most important resource and the same is termed as 'Information Policy'. Information policy is a broad general plan of action to be adopted by an organisation or government. Such policies can be enacted by the legislature or the courts or emerge from international organisations and regulatory bodies. The main objectives of an information policy statement is to :

- Identify the user needs
- Intensify bibliographical control of all types of information resources
- Identify the information products and services
- Development of manpower
- Standardisation in all the components of library and information centres
- Promote international information co-operation.

At present there is hardly any national programme of library and information service for the development of library and information activities by the union government, state/union territory governments and by other agencies in the country. As a result existing programmes continue to develop throughout the country in an un-coordinated way. In some cases, it leads to incompatible systems and even counter productive activities. For this purpose, it is highly essential that immediate steps are taken to ensure that future development of the nation's library and information resources would occur in a cohesive manner according to a national plan based on a national policy for library and information service. This national policy is going to serve as guidelines for the development and improvement of library and information services in the country in the years to come. Indian Information Policy must cover all aspects with regard to user needs, information resources, manpower, standardisation etc. The policy



issues that need attention are as under :

1. **User Needs** : It shall be the national policy of the Govt. of India to recognise users, their identification and information needs.
2. **Information Resources** : It shall be the national policy of the Government of India to manage the country's resources of scientific, technical and economic information.
3. **Information Products and Services** : It shall be the national policy of Govt. of India to intensify the indigenous generation of scientific, technical and economic data and information.
4. **Information Sector Manpower** : It shall be the national policy of the Govt. of India to promote the development of adequate manpower in the information sector.
5. **Standardisation** : It shall be the national policy of the Govt. of India to recognise the standard techniques, methods, procedures, hardware and software.
6. **International Information Co-operation** : It shall be the national policy of the Govt. of India to participate in international programs which facilitate equitable exchange of information.

#### **Intellectual Property Rights**

Intellectual property right is a general term which covers copyright, patterns, registered designs and trademarks. Developed countries demand protection against piracy while developing countries feel that such protection will prevent entry of newcomers. The new information society needs free flow of information while Intellectual Property Rights (IPR) is a hurdle to it. The World Trade Organisation (WTO) should treat Information Technology (IT) industry as priority area and provide requisite facilities viz. concessional tariffs and subsidies to developing countries. This may help prevent piracy of IT products and provide global access to electronic information.

Development in modern digital technology have led to a review of the provisions of IPRs both at national level by many countries. The developing countries are also catching up with this trend as the value of IPRs is increasingly felt. The following issues must be taken up in this regard :

- Copyright regulations and legislations
- Influence of Internet

- Problems and concerns in Cyberspace
- Usage of digital signatures
- Security of information over networks.

#### **Conclusion**

Information Society is passing through many challenges due to lack of Information Professional's Skills, Information Management Skills and Up-to-date Subject Knowledge. Changed roles of Information Managers have also been highlighted. Making available proper information infrastructure, information management techniques, proper information policies and proper intellectual property rights (IPRs) will certainly make Information Society of 21st century a grand success. We must carry out the suggested strategies to ensure survival of information society of tomorrow.

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# NCERT

## Admission Announcement 1999-2000

### Post-Graduate Diploma Course in Guidance and Counselling 1999-2000

Applications are invited for admission to a Post Graduate Diploma Course in Guidance and Counselling offered by the NCERT for the session 1999-2000. The course will commence on 2nd August, 1999.

Admission to the course is on all India basis. Admission test and interview will be held on 18th June, 1999 at Allahabad, Bangalore, Bhubaneswar and New Delhi. Candidates may take the admission test in English or Hindi. Exact venue of the test and interview will be intimated to the candidates by post. No TA/DA will be paid for appearing in the Admission test.

**Duration of the Course :** 9 months

**Seats :** 35

**Scope :** Candidates after passing this course will be eligible for recruitment to the post of Guidance Counsellor in the schools, State Bureaus of Guidance and Child Guidance Clinics etc.

**Eligibility :** Master's degree in Psychology or Education with atleast 55% marks. Relaxation of 5% marks for SC/ST candidates is allowed.

**Age :** Preferably below 40 years as on the date of admission.

**Tuition Fee :** A tuition fee of Rs. 250/- per month will be charged from every candidate except SC/ST candidates.

**Scholarships :** 20% scholarships @ Rs. 500/- per month shall be given to poor but meritorious students including SC/ST categories so long as they continue to perform well as per the existing norms.

**Reservations :** 15% seats are reserved for Scheduled Casts and 7.5% of seats for Scheduled Tribes.

**How to apply :** Applications on Plain paper, written clearly, mentioning the following details along with attested copies of marks-sheets, and SC/ST certificates wherever applicable should reach at the address given below latest by 3rd May, 1999.

1. Name (in block letters) 2. Sex 3. Address (in Block letters) 4. Telephone No. if any 5. Whether belongs to SC/ST 6. Date of birth 7. Educational qualifications (in a tabular form) mentioning examinations passed, name of the University, percentage of marks, year of passing, papers/subjects offered. 8. Experience, if any 9. Names and complete addresses of two referees who have taught the candidate in the last University/College. 10. Centre where candidate will like to appear for Selection Test and Interview. Tick any one : Delhi/Allahabad/Bangalore/Bhubaneswar.

**Note :** 1. Preference will be given to candidates sponsored by the state education department, and schools under the Registered Societies, subject to an undertaking by the employer that after passing the course the candidate's services will be utilized in the area of guidance at least for a period of three years. 2. Those in service should send their application through proper channel. 3. Applications received late or incomplete in any respect will not be considered. 4. Medium of instruction for the Course is both English and Hindi. 5. Limited hostel facilities are available.



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# Letter to Headmaster

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**Here is a letter written by Abraham Lincoln, the 16th President of the United States of America (1861-1865) to the headmaster of a school in which his son was studying. It sums up as to what education is all about; the very essence of education. We are pleased to reproduce it for the benefit of our readers.**

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He will have to learn, I know, that all men are not just, all men are not true. But teach him also that for every scoundrel there is a hero; that for every selfish politician, there is a dedicated leader. Teach him that for every enemy, there is a friend. It will take time, I know; but teach him, if you can, that a dollar earned is of far more value than five found... Teach him to learn to lose... and also to enjoy winning. Steer him away from envy, if you can. Teach him the secret of quiet laughter. Let him learn early that the bullies are the easiest to lick... Teach him, if you can, the wonder of books... but also give him quiet time to ponder over the eternal mystery of birds in the sky, bees in the sun, and flowers on green hillside.

In school teach him it is far more honorable to fail than to cheat... Teach him to have faith in his own ideas, even if everyone tells him they are wrong... Teach him to be gentle with gentle people and tough with the tough. Try to give my son the strength not to follow the crowd when everyone is getting on the band wagon. Teach him to listen to all men... but teach him also to filter all he hears on a screen of truth and take only the good that comes through.

Teach him, if you can, how to laugh when he is sad... Teach him there is no shame in tears. Teach him to scoff at cynics and to beware of too much sweetness... Teach him to sell his brawn and brain to the highest bidders; but never to put a price tag on his heart and soul. Teach him to close his ears to a howling mob... and to stand and fight if he thinks he's right.

Treat him gently; but do not cuddle him because only the test of fire makes fine steel. Let him have the courage to be impatient..., let him have the patience to be brave. Teach him always to have sublime faith in mankind.

This is a big order; but see what you can do... He is such a fine little fellow, my son.

[Reproduced from *Perspectives in Education*, Vol. 15 Special Issue, February 1999.]

# Towards an Egalitarian Society

**Prof. U.R. Rao, Member, Space Commission and Dr. Vikram Sarabhai Distinguished Professor, Department of Space, Bangalore, delivered the Convocation Address at the XXI Annual Convocation of the Indian School of Mines, Dhanbad. He said "The phenomenal discoveries in bio-technology, agriculture and genetic engineering can indeed ensure food and health security to the growing population. The great challenge of creating an egalitarian society, however, can only be met by evolving appropriate sustainable development strategies and implementing them in a time bound manner by committed scientists and technologists and not by pontificating the empty rhetoric of technology vision without backing it with a goal oriented practical programme." Excerpts**

Since the advent of the agricultural revolution 10,000 years ago, humankind has traded its collective labour power against much larger entitlement of commodity bundles of natural resources, both renewable and non-renewable, the negative balance being accounted by over-exploitation of nature. Indiscriminate grazing of the renewable natural resources pales into total insignificance compared with the commercialisation of the limited non-renewable resources of the earth, particularly since the industrial revolution. What took nature millions of years to build is being expended in a few decades at an ever increasing rate, with the current doubling rate of mineral consumption estimated at about 35 years. The colonial powers essentially plundered the colonies in the past and impoverished the already poverty stricken developing countries, in their greed to build an over-consumptive affluent society which led Gandhiji to lament "It took Britain the resources of half the planet to achieve their prosperity. How many planets will a country like India require"? Indiscriminate, exploitation of mineral wealth in turn has led to severe degradation of land and environment resulting in unacceptable sulfur dioxide contamination of air, acid rain precipi-

tation, and pollution of surface as well as underground water resources. Estimated quantity of recoverable non-renewable resources in India indicates, that coal, iron magnesite and bauxite will last less than 200 years, copper, zinc, manganese and chromite about 50 years and crude oil and natural gas not more than 20 years, even at the present rate of consumption. Exponentially increasing population, expected to reach 1.5 billion by 2050 will further increase the demand for both renewable and non-renewable resources, which can only be met by discovering new resources and initiating sustainable development strategy.

The classical understanding of the earth as a giant multi-layered onion, made up of the outer most thin crustal layer on which humankind lives, below which are layers of rocky mantle, liquid iron and the hard inner-most core has itself undergone drastic changes with surprising new discoveries. About 3000 km beneath the planet's surface, at the base of the mantle, blobs of gooey, continent sized, semi-molten rocks which seem to be the seat of volcanic hot spots, have recently been discovered from the slowed down seismic waves following the diffusive phase path. The geological history

of the earth is truly the outcome of the continuous tango dance between pressure and temperature, increasing temperature wanting to melt geological materials and the increasing pressure fighting back to hold the equilibrium. The highly complex processes operating within the geological cycle due to variety of internal dynamic processes and external currents induced by earth's ionosphere and magnetosphere, manifest themselves as continuous changes in the geological pattern of the earth. The time scales of these complex processes vary widely between millions of years seen in the shift in lithospheric plates to as low as a few seconds present in the seismic events. In spite of the extremely complex geological behaviour of the earth and the limitations of human cycle of observations, systematic geophysical explorations involving detailed mapping and measurement of the subtle variations in electromagnetic, gravimetric, seismic, magnetic, thermal and radio-active fields, both in space and time domains, have greatly helped in the understanding of our planet.

Recent technological developments in mineral prospecting have made it possible to detect new mineral resources, mining of deeper reserves and utilisation of poor-grade ores. Extremely sensitive, time-domain instruments are used today to carry out draping surveys with airborne equipment to discover new mineral resources even where the target is buried under a large "overburden" of unmineralised soil and weathered rock. Use of bacterial treatments to intensify the content of precious metals such as platinum and gold in the scarce resource ores are likely to become mature in the near future. A considerable amount of

*(Contd. on page 28)*

## World Statistics on Education — 2

Percentage of female students in total enrolment in each field of study, by region, 1985 and 1995

Region	Number of countries*	Education		Humanities		Law and social sciences		Natural sciences, Engin., and Agric.		Medical sciences	
		1985	1995	1985	1995	1985	1995	1985	1995	1985	1995
WORLD TOTAL	71	45	48	52	57	34	41	17	21	44	56
More developed regions	19	68	72	66	69	40	49	21	25	54	58
Countries in transition	5	55	67	62	54	48	59	22	31	52	62
Less developed regions	47	34	37	32	44	29	35	14	18	34	46
of which:											
Sub-Saharan Africa	14	23	21	30	21	22	19	15	7	29	15
Arab States	9	54	57	46	52	28	37	25	29	40	44
Latin America/Caribbean	12	40	72	26	68	29	52	19	31	37	62
Eastern Asia/Oceania	7	28	23	28	34	29	25	8	11	27	35
Southern Asia	2	31	46	18	46	32	28	15	21	43	57
Least developed countries	11	23	20	13	13	19	18	11	12	31	33

\*Countries for which data are available.

Number of teaching staff (in thousands) and student-staff ratio, by region, 1980-1995

Region	1980		1985		1990		1995	
	Teaching Staff	Student-staff ratio	Teaching Staff	Student-staff ratio	Teaching Staff	Student-staff ratio	Teaching Staff	Student-staff ratio
WORLD TOTAL	3 788	14	4 332	14	5 068	14	5 916	14
More developed regions	1 574	15	1 667	15	1 944	15	2 416	14
of which:								
North America	757	18	752	18	896	17	983	17
Asia/Oceania	259	11	294	10	339	10	488	13
Europe	558	12	622	13	710	14	945	13
Countries in transition	883	13	905	12	951	11	972	11
Less developed regions	1 332	12	1 760	14	2 173	13	2 528	14
of which:								
Sub-Saharan Africa	43	13	65	14	78	18	118	16
Arab States	83	16	108	19	136	18	167	19
Latin America/Caribbean	388	13	506	13	641	11	728	11
Eastern Asia/Oceania	487	11	698	13	871	12	968	13
Southern Asia	310	13	362	15	414	16	505	16
Least developed countries	38	17	50	21	62	19	94	18

Source: World Statistical Outlook on Higher Education: 1980-1995, Working Document, World Conference on Higher Education, UNESCO, Paris, 1998.

Estimated public current expenditure per student, by region and by level of education, 1985 and 1995\*

Region	Number of countries	Years	Pre-primary, primary and secondary					
			All levels		Pre-primary, primary and secondary		Tertiary	
			US\$	% of GNP per capita	US\$	% of GNP per capita	US\$	% of GNP per capita
WORLD TOTAL	113	1985	683	22.4	532	17.5	2 011	66.1
		1995	1 273	22.0	1 052	18.2	3 370	58.2
More developed regions	22	1985	2 344	20.5	1 982	17.3	3 498	30.5
		1995	4 979	21.4	4 636	19.9	5 936	25.5
of which:								
North America	2	1985	3 107	19.0	2 900	17.8	3 761	23.0
		1995	5 150	22.0	5 021	21.5	5 596	23.9
Asia/Oceania	4	1985	2 131	19.7	1 823	16.9	3 720	34.4
		1995	5 727	18.3	5 390	17.2	5 488	17.5
Europe	16	1985	1 803	22.1	1 385	16.9	2 975	36.4
		1995	4 552	22.7	4 062	20.3	6 585	32.9
Countries in transition	26	1985	571	22.7	473	18.8	666	26.5
		1995	432	20.5	377	17.9	457	21.7
Less developed regions	65	1985	101	17.5	74	12.8	602	103.9
		1995	217	17.7	165	13.5	967	78.9
of which:								
Sub-Saharan Africa	23	1985	92	29.0	72	22.6	1 531	481.5
		1995	87	30.4	66	23.2	1 241	433.9
Arab States	9	1985	476	24.9	364	19.0	2 211	115.6
		1995	444	20.5	360	16.6	1 588	73.5
Latin America/Caribbean	18	1985	211	11.7	153	8.5	548	30.4
		1995	444	12.9	352	10.2	937	27.2
Eastern Asia/Oceania	8	1985	60	13.8	44	10.1	406	93.1
		1995	155	15.3	116	11.5	709	70.3
Southern Asia	5	1985	77	17.8	56	13.0	333	77.6
		1995	223	18.8	168	14.1	1 058	89.1
Least developed countries	17	1985	34	17.7	25	12.9	299	153.9
		1995	33	16.6	26	12.8	252	125.6

\*Countries included in each region were the ones for which data were available for the years around 1985 and 1995.

Public current expenditure per student in higher education, by region, 1985 and 1995

Region	Current expenditure per student (US\$)		As % of GNP per capita	
	1985	1995	1985	1995
WORLD TOTAL	2 011	3 370	66.1	58.2
More developed regions	3 498	5 936	30.5	25.5
of which:				
North America	3 761	5 596	23.0	23.9
Asia/Oceania	3 720	5 488	34.4	17.5
Europe	2 975	6 585	36.4	32.9
Countries in transition	666	457	26.5	21.7
Less developed regions	602	967	103.9	78.9
of which:				
Sub-Saharan Africa	1 531	1 241	481.5	433.9
Arab States	2 211	1 588	115.6	73.5
Latin America/Caribbean	548	937	30.4	27.2
Eastern Asia/Oceania	406	709	93.1	70.3
Southern Asia	333	1 058	77.6	89.1
Least developed countries	299	252	153.9	125.6



worldwide effort is focused on rapidly developing sea-bed mining technology to tap the abundantly available ocean mineral resources. The advent of space age four decades ago, added a totally new dimension to the development of geo-sciences, by providing an integrated view of the entire planet as a whole. Extensive exploration of planetary geology, particularly of the Moon, Mars and Venus with space probes, have provided a new insight into the origin and geological evolution of the earth itself. The possibility of exploiting mineral resources on Moon and on other planets such as Mars could well become a reality in the next few decades.

Remote sensing of the solid earth from the vantage point in space provides an understanding of its evolution and a snap shot of all the slow processes operating over geological times. Vast improvement in gravity measurements using space borne and airborne equipment have made it possible to discern gravity anomalies at 0.1 milli Gal sensitivity. Synoptic measurement of magnetic field over large areas have helped in the identification of broad magnetic anomaly areas, facilitating identification of small scale anomalies and their gradient at a sensitivity of better than .02 nano-tesla per meter. High resolution optical remote sensing and synthetic aperture radar interferometry from space are able to delineate liniments, faults and outcrops by measuring subtle topographical changes. Use of space or air borne visible and infra-red imaging spectrometers with a very narrow band-width provide unique signatures to quantitatively estimate individual chemical and mineral deposits. Hydrocarbon micro-seepage detection through narrow spectral band absorption measure-

ments along with global positioning systems are able to localise new hydrocarbon resources. Even geobotanical and biogeochemical remote sensing, which reflect the chemical composition of the soil, are now increasingly being used as a complementary or supplementary research tool in mineral prospecting, thus providing a new thrust to "Mission to Planet Earth".

Another important area where space remote sensing together with Global Positioning System, laser ranging and VLBI techniques are making valuable contributions is in the understanding of earthquake phenomena. Of all the natural disasters, frequently erupting earthquakes are by far the most devastating in terms of their property damage potential. More than 55 per cent of the Indian region is seismically active where earthquakes of magnitude more than 6 have taken place in the past. Although successful prediction of earthquakes is still far from being realised, a variety of instruments such as ocean bottom seismometers, seismic tomography and satellite based laser ranging are providing a better understanding of earthquake hazards. Seasat and Topex-Poseidon spacecraft have established our ability to detect and quantitatively estimate rates and direction of crustal deformations and surface displacements to better than 3 cm. a year. Use of synthetic aperture radar interferometry in conjunction with the global positioning systems and more accurate digital elevation models holds a great promise for evolving a satisfactory earthquake prediction mechanism in the coming decades.

Data from our own highly sophisticated Indian Remote Sensing Satellites have been extensively used to delineate important geological features such as folds, faults and fractures and to identify signatures directly related to min-

eralisation. Satellite imageries combined with other geophysical data have helped in discovering new mineral resources such as lead, zinc, base metals, coal and lignite bearing zones in a number of states including Gujarat, Rajasthan and North Eastern India. Under the integrated study project named "Vasundara", several potential target areas containing base metals, industrial minerals and precious metals have been identified in south Indian peninsula. Thermal mapping from space has been used to reveal even underground coal fire in Jharia coal field in Bihar. Detection of oil spills in the oceans and continuous monitoring of environment over coastal as well as land areas has become possible with our remote sensing satellites. Radar interferometry and narrow band spectroscopy are being developed for accurate geophysical prospecting.

Yet I must express my deep concern at the extremely poor performance of our geological and mineral exploration effort. In the vital energy sector, much needs to be done particularly to exploit major oil reserves and other minerals through deep sea drilling. Outdated equipment, which is atleast an order magnitude poorer in sensitivity, a rigid bureaucratic system of management, demoralised staff, clash between the vested socio-political interests of the state and the centre have led to the seductive invasion of a number of foreign consortium for mineral exploration. Even 50 years after independence, ores are continuing to be exported for making value added products elsewhere, and regrettably the final products derived from our own ores are denied to us under embargo restrictions, particularly in high technology areas. But for the collaborative efforts of the space department with atomic energy, DMRL and

Midhani, which have resulted in setting up special processing facilities to make valuable Beryllium products, maraging steel, light weight alloys like Aluminium-Magnesium, Titanium products etc., our national programmes in space, atomic energy and defence sectors would have been seriously paralysed.

Development of science and technology in India, which greatly suffered during the three centuries of colonial rule, got its due recognition as the basic necessary tool for national development only with the adoption of the science policy resolution in 1958. The initiation of green revolution in the early sixties, no doubt enabled the country to increase its food production from 55 to over 190 million tons a year. Spectacular developments in space technology have already revolutionised communication, distance education, meteorological forecasting, natural resource management, environmental monitoring and mineral prospecting. Notwithstanding, the impact of science and technology on the overall social and cultural life of our country has been negligible excepting in a few selected areas like agriculture, space technology and nuclear sciences. Our country with less than 2% of global land area, carries 16% of the global population, has less than 1.5% of forest, accounts for only 3% of energy production and contributes to just 1% of global GDP. Almost 40% of our population continue to be illiterate and over 25% do not even have access to safe drinking water. Exponentially increasing population, poor agricultural productivity, fast degrading environment, growing urbanisation, large scale unemployment, poor industrial growth, inadequate infrastructure, poor health care and large scale illiteracy have resulted in the extremely poor quality of life

in the country, which is rated a low 135th position amongst 175 nations in terms of Human Development Index. Considering that a demographic investment of 2.5% in economic growth is necessary for every one per cent increase in population, India has to achieve a sustained economic growth rate of at least 10% per year. Unless our food production is doubled in the next four decades on a sustainable basis, total energy production in the country is at least quadrupled and new minerals and metals are discovered, the country will not be able to provide basic food, health, economic and environmental security to our people.

Spectacular developments in science and technology in the last few decades have demonstrated that our planet is truly a global village in which the fate of each country is linked with the world as a whole, through weather, climate, geosphere and biosphere. Space technology has shrunk time and distance to usher the age of information superhighway through Direct to Home TV, Digital Audio Broadcasting, Multimedia Services, Global Mobile Personal Communication and Computer Telephony, enabling us to have instantaneous access to any information. Technological tools are today available for efficient management of natural resources, disaster monitoring, tele-health, environmental protection, human resource development and unearthing the true mineral secrets of our planet. The phenomenal discoveries in bio-technology, agriculture and genetic engineering can indeed ensure food and health security to the growing population. The great challenge of creating an egalitarian society, however, can only be met by evolving appropriate sustainable development strategies and implementing them in a time bound manner by committed

scientists and technologists and not by pontificating the empty rhetoric of technology vision without backing it with a goal oriented practical programme.

Philosophical statements such as "If we are to lead the world towards a hopeful future, we must understand that technology is part of the planetary environment, to be shared like air and water with the rest of the mankind" are pronounced in every conceivable international forum. In reality, however, industrialised nations, with their technological superiority, continue to commercially exploit the developing nations. Globalisation of economy and free market competition under the continuous threat of technology control regimes, discriminatory barriers, severe embargoes and unfair trade practices have placed the developing nations at the mercy of technological imperialism. Instead of providing preferential access to developing countries for selling their products and services in the global market, attempts are made to restrict the competition in the name of fair geographical returns policy, quota system and equally dubious arguments based on level playing field and human rights. While trying to force the less capable developing nations to conform to the environmental norms, the richer nations, who have been the main polluters of the environment, are trying to wriggle out of the treaties such as Montreal Protocol or Rio declaration because of their unwillingness to accept even a marginal decrease in their life style.

The difficult and complex problems facing India of the next millennium can only be solved by realising that knowledge and information have become the foundation stones on which the modern power structure is built. Knowledge becomes wealth when invention and innovations can be

ished in the global market place and designs are converted into useful value added products. Technological self-reliance can only be achieved by nurturing excellence in our institutions of higher learning through highly motivated teachers carrying out top quality research and by forging an intimate organic linkage between our research institutions and industries. Unless the prevalent kit culture, which has made our industries to continuously rely on transfusion from outside for their survival, is replaced by a strong R&D input from academic institutions, Indian industries can never become vibrant, competitive and forward looking. The phenomenal growth of software industry in the recent times is a clear example of what our nation can achieve, if the frame work of policy and goal objectives are clearly defined. In a world where

science and technology has become the most powerful currency of power, where the power of arguments founded on ethical and equitable principles has been replaced by the argument of power based on ruthless technological hegemony, it is only scientists and engineers coming out of our major national institutions such as this who can ensure a safe future for our country. With the intellectual capability we have, I see absolutely no reason why India cannot become a rich powerful nation and a significant global economic power in the next two decades, provided we set ourselves appropriate goals and make them happen through our determined collective effort.

The challenges which you face are no doubt very great but so are the opportunities. The inter-disciplinary character of the highly complex technologies involved in every field requires the technolo-

gists of the future, to quote Alvin Toffler, to be necessarily "T shaped engineers, who while seeking their own subject in depth as specialists, do so in the global context of a broad spectrum of activities in different allied disciplines which can contribute to enrich their own professional career". While the statement that the last three decades have been the golden age of earth sciences is true, the next three decades will constitute decisive decades for humanity in the next millennium. As Sir C.V. Raman said, "If only you can replace the inferiority complex, and defeatist spirit imbibed during the last three hundred years with a new spirit of hope and confidence, of dedication and commitment, of determination and victory", I have no doubt you will enable this nation of ours to once again occupy its rightful pride of place in the community of nations.



## CENTRE FOR DEVELOPMENT OF IMAGING TECHNOLOGY (C-DIT)

**THIRUVANANTHAPURAM-695 027, KERALA**

(An Autonomous Research, Training and Video Production Centre under the Govt. of Kerala)

### ADMISSION NOTIFICATION FOR POST GRADUATE DIPLOMA IN SCIENCE AND DEVELOPMENT COMMUNICATION (DSDC)

Applications are invited from eligible candidates for admission to the one-year, full time, Diploma in Science and Development Communication (DSDC) programme of the Centre. This is an intensive video production course offering training in various aspects of video production including direction, scripting, videography, editing, sound recording and computer graphics. Topics in science studies, development studies and communication would also be taught as it is a specialized training programme in Science/Development/Educational video making.

**Eligibility :** A bachelor's degree in any discipline with a minimum of 50% marks in aggregate (45% for SEBC candidates whose annual family income is not above Rs. 42,000/-). SC/ST candidates need obtain only a pass in the qualifying examination. Those awaiting results can also apply.

**Seats :** Total seats - 20. Six seats are earmarked for graduates in Natural Science and allied disciplines and two seats for women. Five seats are reserved for foreign nationals and wards of NRIs on differential fee basis. SC/ST and SEBC candidates will be given reservation as per the existing rules of the Government of Kerala.

Application forms and prospectus can be obtained from the Course Director, Communication Training Division, C-DIT, Chitranjali Studio Complex, Thiruvananthapuram-695 027, Kerala, on request accompanied by a crossed Indian Postal Order or Demand Draft for Rs. 25/- drawn in favour of "The Registrar, C-DIT", payable at "Thiruvananthapuram". Request by post should also be accompanied by a self addressed and stamped (Rs. 6/-) envelope (26x11 cms). Applications duly filled in should reach the Centre on or before 03 April 99.

**Entrance Test :** The candidates are required to take an entrance examination on 10 April 1999 to be held at Thiruvananthapuram and a few other centres like Chennai, Bangalore and New Delhi. C-DIT reserves the right to change or cancel any of the examination centres and/or date, if found necessary.

Contact telephone : 458910, 464895, 463506, 461646. Fax : 0471-460681 E-mail:cdit@glam01.vsnl.net.in

Thiruvananthapuram  
29th January, 1999

**REGISTRAR**

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## CAMPUS NEWS

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### Workshop on Human Rights

There is need for developing and strengthening national capacities for the promotion and protection of human rights in accordance with local conditions, a Asia-Pacific conference has recommended. The meet also recommended, among many other things, establishment and support to human rights educational programmes in universities of the region. The three-day seventh workshop on regional cooperation for the promotion and protection of human rights concluded recently in New Delhi.

Delegates from 30 countries felt that this could be the strongest foundation for effective and enduring regional cooperation in the field of human rights.

During the meet they reviewed the follow-up concerning the framework of regional technical cooperation agreed upon at last year's meeting in Tehran.

Emphasising the need to start human rights education programmes in the universities, the meet said that training and higher education fellowships for scholars specialising in human rights should be initiated and networking among educational institutions specialising in human rights issues in the region should be developed.

The United Nations High Commissioner for Human Rights (UNHCHR) in cooperation with UNESCO, should help facilitate exchange of experiences in the field of human rights education, involving national authorities responsible for education, particularly those in charge of framing

curricula at school level, the conference said.

It also recommended development and dissemination of printed and audio-visual material on human rights education.

The meet reiterated the importance of an inclusive, step-by-step and practical approach towards enhancing regional cooperation for protection of human rights in accordance with the pace and priorities to be set up by the governments of the region by consensus.

It reaffirmed the universality, indivisibility, inter-dependence and inter-relatedness of all human rights, including civil, cultural, economic, political, social and the rights to development in the meet which was inaugurated by Mary Robinson, UNHCHR.

Recognising that democracy, development and respect for human rights and fundamental freedoms are interdependent and mutually reinforcing, delegates called for mainstreaming and effective coordination of technical cooperation in all areas of human rights as an essential element of promotional approaches that build capacities and ensure effective solutions.

Delegates welcomed the UNHCHR's decision to allocate \$ 730,000 for the implementation of the regional projects foreseen under the Tehran framework of the regional cooperation for the Asia-Pacific region and also to make available, on the request of the member states, the services of a regional human rights adviser as

a regional project officer for their implementation.

Noting the vastness and the diversities within the Asian and Pacific region, the conference expressed its commitment to enhance regional cooperation to promote universal respect for and observance of human rights.

During 1999-2000, under the regional technical cooperation programme an inter-sessional workshop would be organised in Thailand to examine the contribution that national plans of action can make to the advancement of human rights and learn from practical difficulties experienced by states in developing and implementing them and formulate strategies for their creation.

An inter-sessional regional workshop on the right to development and economic, social and cultural rights focussing on the implementation of these rights and steps to be taken at the national and international level for this should be held, the meet recommended.

The Asia Pacific Forum would organise workshops on national human rights institutions in Sri Lanka and Manila in June and September this year respectively.

### Science and Media

Science writers and communicators should avoid mythological analogy to popularise science among the people, observed eminent astro-physicist J.V. Narlikar. Mistaken analogies like comparison of cloning with the birth of the Kaurava brothers in the Mahabharata deviated from serious science by superficially presenting it, he added. Mr. Narlikar,

Director of the Inter-University Centre for Astronomy and Astrophysics (IUCAA) was addressing a seminar on 'Science and Media' in Pune recently.

"Science communicators need to be persuasive rather than aggressive in fighting superstition," he said adding scientists were duty bound to report their findings to the society which supports scientific research.

Accountability of scientists had been more to peer groups for recognition and reward than the public, M.M. Chaudhari, Director of the Delhi-based Consortium for Educational Communication (CEC) under the University Grants Commission (UGC), said.

India should tap the large pool of scientists who were good communicators, but lacked the urge to communicate, Mr. Narlikar said. The scriptures cannot account for all modern scientific developments and "pseudo sciences" like astrology should be discouraged, he said.

Science popularisation in regional languages should be encouraged and the bond between scientists and society strengthened, he said.

Scientists promoting public understanding of science should be recognised for their work, R. Ramachandran, science correspondent of *Frontline*, said.

Indian scientists lacked a collective commitment to popularise science but were keen to work for earning laurels from organisations abroad, Rajesh Kocchar, professor of astrophysics at the Indian Institute of Astrophysics in Bangalore, said.

Some scientists took advantage of the ignorance of science among the public and media. En-

couragement of pseudo-science by the media discouraged scientists, he said.

India should establish a "science media centre" with a library of photographs and films to help science communicators, science writer Dilip M. Salwi said. Regional languages should come out with new terms for science writing, he added.

### **Anna Varsity & UAS, Suderburg Tie Up**

A Memorandum of Understanding (MoU) was recently signed between the Anna University and the University of Applied Sciences, Suderburg, Germany, to further the common academic goals in the area of environment studies and water resources management.

Prof. R.M. Vasagam, Vice-Chancellor, Anna University, and Prof. H.D. Olbrisch, Director, Postgraduate Study Programme, University of Applied Sciences, Suderburg, Germany, signed the MoU at the Anna University.

Prof. Vasagam said as part of the MoU between the two Universities, an exchange programme from both sides had already taken place to work on the analysis and penetration of heavy metals in fluvial and estuarine sediments of river Adyar in Chennai.

Under the on-going Indo-German project, the Centre for Environmental Studies (CES) had received DM 5 million in the first phase. The objectives of the project include upgradation of laboratories, improving consultancy, imparting training to teaching and non-teaching staff of the Centre, reviewing and revising the curriculum, upgrading and modernising environmental information system, strengthening financial

self-reliance and strengthening the management structure of the Centre, enlarging the scope of CES-Industry collaboration and providing additional teaching and research personnel.

The CES, Prof. Vasagam said, was involved in fundamental and applied research. Assessment of chemical and biological characteristics of water bodies, treatment and reuse of wastewaters, biomagnification, ground water recharge, degradation of toxic wastes, management of solid wastes as well as management of community wastes are some of the areas of investigation at the Centre.

Speaking on the occasion, Prof. Olbrisch said the rural location of the University of Applied Sciences, Suderburg in Germany, offered the best opportunities to effectively introduce innovative solutions to the water problems of the future.

The areas of research include: environmental technology to protect water and soil, improvement of recycling concepts for solid and liquid wastes, lead recycling, techniques for the analysis of soil contaminants and hazardous wastes landfill management.

Prof. D. Beck, Long Term Consultant, Indo-German Project, Centre for Environmental Studies, Anna University, said the collaboration provided for exchange of faculty, students, information and publications and joint research activities.

Prof. G.B. Jaiprakash Narain, Director, Centre for Environmental Studies, Anna University, said the CES was a premier centre offering P.G. programmes in Environmental Engineering and Sciences, and infrastructure facilities available at the Centre included



environmental information library, analytical laboratory, environmental microbiology, and a modern tool room among others.

### **Chair in Indian Philosophy**

The first Chair of Indian Philosophy in Russia was recently inaugurated at the Moscow Institute of Philosophy. The Chair named after Mahatma Gandhi has been established in keeping with the 1996 inter-governmental agreement on cultural cooperation between India and Russia. It will provide introductory and advanced training in the history of Indian philosophy to about 200 students at the Institute of Philosophy, Russia's premier teaching and research school attached to the country's Academy of Sciences.

Speaking at the inauguration ceremony, India's Ambassador to Russia, Mr. Satinder Kumar Lambah, welcomed the event as "a quantum jump in bilateral relations" that would give a fresh impulse to mutual understanding and friendship.

The Director of the Institute of Philosophy, Mr. Vyacheslav Stiepin, stressed the relevance of Indian philosophy in the modern world. "Indian philosophy gives us answers to some of the global threats and challenges of the modern age," he said. "Indian philosophical ideas, such as non-violent management of objects and perception of nature as a living organism, have been adopted by present-day scholars as guiding principles for post-industrial society."

According to Mr. Stiepin, his institute was already getting requests from other Russian institutions to train their students in Indian philosophy. He said the new chair would work to make Indian

philosophy an integral part of philosophic education in Russia.

Under agreement between the Jawaharlal Nehru Cultural Centre at the Indian Embassy in Moscow and the Moscow Institute of Philosophy, the Indian side will provide technical and financial assistance to the new chair, including the establishment of a library of Indian books, supply of teaching aides, publication of works by Russian scholars and the setting up of exchange programme for Indian and Russian philosophers. The Indian Council for Cultural Relations has also instituted a Mahatma Gandhi scholarship to be awarded to the best Russian student of Indian philosophy.

The new chair will be headed by Prof. Marietta Stepaniants, a recognised authority on Indian philosophy. Her latest book, "Gandhi and the world today", was brought out by Rajendra Prasad Academy in Delhi last year.

### **Pune Varsity Golden Jubilee**

The Maharashtra Governor, Dr. P.C. Alexander, made radical suggestions on improvement of the content and quality of education, improving the standards of teachers, delinking a certain number of jobs, autonomy to colleges and differential rate of fee structure in higher education. He was delivering his presidential address at the golden Jubilee celebrations of Pune University in Pune recently. He said on the one hand there could be satisfaction over the rise in number of higher educational institutions from just 9.3 per cent immediately after Independence to about 34 per cent in 50 years, but on the other hand, there should also be concern over the quality and content of education and the mad rush of boys and girls going in for higher education

even when it is not required for certain jobs.

He called upon the state government to ponder and take lead in delinking certain number of jobs — particularly in local self bodies and corporations — where higher education may not be necessary. This could be done by making the lower level of education more complete.

Dr. Alexander said good infrastructure alone could not provide education, good teachers were also necessary. No serious thought had been given on producing quality teachers to impart higher education, he lamented.

The Governor said that with the increasing number of colleges being affiliated to each of the universities, it was becoming difficult both for the colleges and the university to run the institutions due to financial crunch.

He urged the government to ascertain whether managements intending to open newer colleges had sufficient funds and could offer scholarships to deserving students and economically backward sections of the society before granting permission.

If a differential fee structure was introduced, those who could afford should be charged, while others should be provided scholarships and fellowships.

The Governor felicitated former vice chancellors — Dr. B.P. Apte, Devdutt Dhabolkar, Dr. Ram Takavale, Dr. V.G. Bhide, Dr. Shridhar Gupte and Mr. Vasant Gowarikar - and also veteran Gandhian Balasaheb Bharade, social workers Govind Bhai Shroff, Prof. Vasant Kanetkar, Yogacharya B.K.S. Iyengar, Rohini Bhate and Dr. H.J. Arnkar.

The Leader of the Opposition in Lok Sabha, Mr. Sharad Pawar,

called upon the university to emphasise on information technology and genetic engineering as the country enters into the new millennium.

While Chief Minister, Mr. Narayan Rane, announced a grant of Rs. 1 crore for the university's information technology project, the Bank of Maharashtra CMD, Mr. Madan Mohan Vaish, announced a Rs. 25 lakh grant. The City MP, Mr. Vithal Tupe, contributed Rs. 10 lakhs from his development fund.

The Deputy Chief Minister, Mr. Gopinath Munde, and the Higher and Technical Education Minister, Mr. Datta Rane, also addressed.

In his welcome address, the Vice Chancellor Mr. Arun Nigwekar, announced that the university would set up a "Marathi Bhawan" to propagate Marathi language.

### **Non-subsidy Seats at Madras Varsity**

The Madras University is reported to have decided to create a category of merit-based 'non-subsidy seats' in some of the more sought-after postgraduate courses. These seats would attract a higher fee as prescribed by the state government. The decision, ratified by the syndicate, would allow the university to increase the number of seats in these courses by 30 per cent, above the sanctioned strength.

These seats would be filled "purely on merit, to be decided by conducting written examinations," the Vice-Chancellor, Prof. P.T. Manoharan, said. The additional funds generated by the creation of these seats would go to the corpus and a part toward improving the infrastructure of the department concerned.

The 15 departments which would benefit by the scheme are: Master of International Business; MCA, MBA, M.Sc., in Biotechnology, in Bio-Chemistry, Molecular Biology, Microbiology, Medical Biochemistry, Biomedical Genetics, Environment Toxicology, M.Sc., in Physiology; M.D. in Anatomy, Pathology and Microbiology.

To give effect to the decision for MCA and MBA courses, the university would formally approach the AICTE. "Approximately about 100 additional seats would be created, which could mean a revenue of about Rs. 30 lakhs, a good part of which will go to improve the infrastructure in the departments," he added.

By another decision, it was decided to convert the existing Dr. B.R. Ambedkar Chair in Economics into a Dr. Ambedkar Centre for Economics. The Centre would get Rs. 10 lakhs as annual grant from the union government.

Prof. Manoharan, said recently the university body had approved the permission granted to Vivekananda College, Chennai for opening Ph.D. courses in Botany.

### **Distance Education is Cost Effective**

The 26th World Marketing Congress was recently held in New Delhi. In his paper titled Distance education management — 'A case study of IGNOU' IGNOU Vice-Chancellor Prof. A.W. Khan argued in favour of distance education.

"The amount of money IGNOU spends on each student is one-third the amount spent by conventional universities in the country," he said. "IGNOU meets over 60-65 per cent of its operating costs through internal sources,

the conventional universities manage hardly 5-10 per cent."

The IGNOU authorities claimed that they had managed to generate resources in terms of infrastructure, study material, courses and human resources. The university had also formulated guidelines to achieve optimum utilisation of available resources.

The Vice-Chancellor said that the university was considering extending its programmes to several countries including Bahrain, Doha, the UAE, Kuwait and the Sultanate of Oman. At present, IGNOU's postgraduate diploma in distance education is offered to students of 18 Commonwealth countries under the Rajiv Gandhi Foundation scheme.

### **Financing Education**

The Planning Commission is reported to have asked the States to allocate 6 per cent of Gross Domestic Product (GDP) on education with a stipulation that 60 per cent of these funds be utilised for elementary education.

Planning Commission Deputy Chairman K.C. Pant said that States would have to contribute a major chunk of these funds as Centre's contribution was a meagre 17 per cent of total expenditure on this sector.

He assured the Chief Ministers that Planning Commission would initiate all measures to enhance allocation for education in the next annual Plan discussions.

As of now, just 3.8 per cent of total public expenditure has been set aside for education thereby leaving a gap of 2.2 per cent.

He asked the States to spend 6 per cent of State Domestic Product (SDP) on education, i.e. including both plan and non-plan expenditure.

He told the Chief Ministers that in states where already 6 per cent level has been reached, plan spending may have to be raised to 10 per cent.

Alternatively he asked the states to ensure per capita investment on education at Rs. 1000 per annum. Barring a few exceptions like Kerala, per capita investment on education has been less than Rs. 500.

Mr. K.C. Pant also asked the States to remove all hurdles to private sector willing to get into education as an investment destination.

### **National Congress of Parasitology**

"Increased spending on medical research is a must as its cost-benefit ratio works out to be much more advantageous than the costs, both economic and human, of diseases like malaria or plague" said Space Commission member Prof. U.R. Rao. He was inaugurating the 13th National Congress of Parasitology, organised by the Bangalore University recently. He pointed out that the economic costs of the Surat plague had been estimated at about Rs. 8,000 crore. Similarly, 35 per cent of the young and 25 per cent of the aged population fell prey to parasitic infections, he said. However, while the human and economic costs of these diseases like malaria, leishmaniasis or filariasis were significant, the amount of money poured into research was much less though a fraction of cost invested can lead to much benefit, he said.

In his keynote address, Prof. G. Padmanabhan, Professor emeritus at the Indian Institute of Science, Bangalore, lamented the fact that early research in the country in the area of parasitology was more devoted to parasitic

organisms endemic to the West. However, it would perhaps have been better to research micro organisms which were endemic to diseases.

### **ISTD Book Award**

The Indian Society for Training & Development (ISTD) has instituted a Book Award from the year 1997-98. The Award for the year 1998-99 has been sponsored by Management Development Institute, Gurgaon.

The main objective of the Book Award is to encourage Indian writers to facilitate and make contribution in the understanding of Management Principles and Practices including Industry experiences particularly HRD/Training & Development.

For selection, the book should make an outstanding contribution to the understanding of management principles and practices in India. Evaluation focus would be on originality, topical relevance and appeal to Indian Management, advancement of knowledge and application, readability, quality of presentation and experiences from Indian organisations.

The eligibility criteria is that (a) the book should have been published in the last three years i.e. between April 1, 1996 and March 31, 1999. However, books which have already been considered earlier would not be eligible for the Competition; and (b) the book should be in English.

Three prizes are awarded. The first prize carries a cash award of Rs. 5,000/- and citation/certificate; the second prize carries a cash award of Rs. 3,000/- and citation/certificate; the third prize carries a cash award of Rs. 2,000/- and citation/certificate. In case of joint authors, the prize money will be divided between them equally.

Further details may be obtained from Indian Society for Training & Development, "Training House", B-41, Institutional Area, New Mehrauli Road, New Delhi-110 016.

### **Correspondence Course in Computers**

The Bangalore University Senate is reported to have decided to introduce correspondence bachelor degree courses in computer application (BCA) from the next academic year.

The senate also gave its nod for allowing the affiliate colleges to start regular BCA courses from 1999-2000. The academic council had already approved the proposals.

Vice-Chancellor Prof. N.R. Shetty who chaired the senate meeting said the university had collaborated with a private computer firm, Aptech, to run the correspondence BCA courses. He said the course was being introduced considering its high employment potential.

Dr. Shetty said already several private institutions and the Indira Gandhi National Open University were offering courses in computer science through distance education. The Karnatak University, Dharwad, had already introduced such courses, having tie-ups with Aptech, he said.

He said a high-level committee comprising experts from the Indian Institute for Science and the University had been set up to prescribe the syllabus, prepare the course material and to monitor the course.

The Senate also decided to introduce postgraduate diploma courses in computer applications with special reference to Sanskrit in the department of Sanskrit.

The Senate gave its approval for instituting Defence Studies Chair and Netaji Subash Chandra Bose Chair in the department of political science.

### **Revamping Technical Education**

All technical courses will be remodelled to suit the changing times and measures would be initiated to introduce these courses in some of the institutions in the country, said Prof. S. Rame Gowda, Chairman, All India Council for Technical Education. He was delivering the keynote address at a two-day workshop, 'Revamping of technician education', organised by the AICTE at the Kamala Nehru Polytechnic for Women in Hyderabad recently.

Emphasising the need for accord priority to technical education, he said that the revamp of technical education proposed to be taken up in some of the institutions was one such step towards prioritising technical education.

Some of these institutions would be developed as model polytechnics and would impart training to teachers, he said.

The workshop would finalise the strategies and methodologies to be adopted for upgrading technical education to suit the present needs, he said.

Dr. S. Mohan, Director, CSIO, also stressed on upgrading technical education. Shri G. Sangameshwara, Advisor, AICTE, Shri Bala Veera Reddy, Director, Technical Education, Karnataka, Shri Rajiv Sharma, Commissioner Technical Education, Andhra Pradesh, and principals of various polytechnics from the State as well from Karnataka, Tamil Nadu and Maharashtra participated in the deliberations.

### **Indian Geological Congress**

The Department of Geology, M.L. Sukhadia University proposes to organise the 12th Convention of Indian Geological Congress and National Seminar on Groundwater Resources on 8-12 February 2000 in Udaipur, Rajasthan.

The IGC-2000 Scientific Programs will comprise Technical Sessions on Petrology, Mineralogy, Mineral Resources, Mineral Exploration, Precambrian Geology, Tectonics, Phanerozoic Stratigraphy, Paleontology, Fossil Fuels, Environmental Geology, Geostatistics, Computer Applications, Entrepreneurship etc.

The National Seminar on "Groundwater Resources" will comprise Technical Session on Groundwater Regimes of India, Groundwater Quality, Exploration, Hydrochemistry, and Groundwater Resources in arid and semi-arid areas.

Further details may be obtained from : IGC-2000 Secretariat, Department of Geology, M.L. Sukhadia University, 51 Saraswati Marg, Udaipur-313 002. Fax : 0294-413150 E-mail: igr2k@yahoo.com Home page = <http://www.mlsu.ac.in/conferences/igr2k.html>.

### **SNDT-Zee Education Tie Up**

The SNDT Women's University in collaboration with Zee Education, proposes to offer technology based courses from the ensuing academic year. Programmes tailored for students, teachers and the corporate community include Diploma Courses in Computer Aided Fashion Design, Interior Design and Office Administration.

Special courses for teachers to

orient them on Information Technology are also proposed. The other courses being planned are in Marketing, Hospital and Health Management, Banking and Insurance and Women's Studies. The examinations will be conducted on the lines of tests for Distance Education Courses with some modifications and diplomas and degrees will be awarded by the SNDT Women's University.

### **Work Experience Project**

The Department of Adult and Continuing Education and Extension, University of Mumbai is reported to have launched a Work-Experience Project which will enable a student to gain entry into the world of work, acquire practical experience, try his/her hand at a prospective career, learn to document experiences gained and for all the practical learning be awarded ten additional marks.

Under the project the student will gain, in addition to the marks, a work-experience certificate signed jointly by the college principal and employer. It is expected that this project will provide the beginning for a meaningful sustained interface between the university, business and industry.

For any further details both students and employers can contact Ms Sybil Ranganadhan at the Department of Adult and Continuing Education & Extension, 2nd Floor, Vidyapeeth Vidyarthi Bhavan, 'B' Road, Churchgate, Mumbai-400 020, Telefax No. 281 3020.

### **Snatak Gramseva Puraskar**

Gujarat Vidyapith has recently introduced an Award titled 'Shree Mahadev Desai Snatak Gramseva Puraskar' to be given each year to its two graduates for their long services in villages. This award is

sponsored by Shri Vishnubhai Amin, one of the graduates of Gujarat Vidyapith.

At the Award Giving Ceremony held recently, two awards, for the year 1998 were given to Shri Ghelubhai Nayak and Shri Ramjibhai Vahora by Shree Narayanbhai Desai — the son of Shree Mahadevbhai Desai. The Vice-Chancellor Shri Govindbhai Raval gave the report of the work done in villages by the graduates of Gujarat Vidyapith.

Shree Narayanbhai Desai, who was the chief guest, spoken 'Social Workers and their responsibilities'. Giving details of social work done by the Gujarat Vidyapith, Prof. Ramlal Parikh, Chancellor of the Vidyapith, described the changing dimensions of social services in modern context.

### **Gurukul '99**

The SNDT Women's University recently organised an International Career Guidance and Education Fair — IBM/ACE Gurukul '99. Inaugurating the

Fair, Shri Manohar Joshi, the then Chief Minister of Maharashtra, congratulated the University and other sponsors for organising such a fair. He said that actually such an information fair should have been organised by the Government. The different components of IBM/ACE GURUKUL '99 were Aptitude Testing, Personal Counselling, Comprehensive Lectures, Seminars on Vision 2020, International seminar on foreign education viz. Australian, Italian, French, British and U.S. education apart from the information provided at about 80 stalls at the exhibition. Over 150 students in the age group of 14-17 underwent Aptitude Testing and over 400 students in the age group of 16-25 attended the Oral and Vocational Counselling sessions.

Two public Debates — one on "Privatisation of Education will Make a Modern India" and the other on "Sex Education should be introduced in school" were also organised on the occasion.

sion, Dr. M.S. Swaminathan, an eminent agricultural scientist, said the agricultural development would not only provide employment to more people but would also work effectively to control social disintegration, migration of rural population to urban areas and unchecked growth of slums in the cities.

The number of people who depend purely on agriculture for their livelihood had registered a significant increase during the past decade, even though it had come down in terms of percentage from 70 to 65 per cent, he pointed out; and called for new initiative, accompanied by a broad vision, both at the scientific and political levels, for achieving new heights in sustainable agricultural development.

In an apt reference to Mahatma Gandhi, Dr. Swaminathan said the Father of the Nation used to describe his vocation as farming, which the country should be proud of. "The time has come when the slogan 'Do or Die' should be adopted in the agricultural sector," he said, emphasising that agricultural research must be aimed at finding the real solutions.

The Rajasthan Governor, Mr. Anshuman Singh, in his inaugural address, said the country had a challenging task ahead of marketing itself competitively in the international market, with the General Agreement on Tariffs and Trade (GATT) poised to fully liberalise agricultural trade. Rajasthan, he said, was contributing appreciably towards total production of exportable farm commodities, despite having less than one per cent of the country's water resources.

The Union Minister of State for Agriculture, Mr. Som Pal, pointing out that agricultural com-

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## ***News from Agricultural Universities***

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### **Agricultural Science Congress**

The Fourth Agricultural Science Congress was recently held at Jaipur. It began with a call to attain food security in the country through the stability of agricultural production and sustainability of agricultural exports. About 500 agricultural scientists from across the country who participated in the event discussed various aspects of research for realising the goal of food security.

Organised by the National

Academy of Agricultural Sciences (NAAS) in collaboration with the Rajasthan Agricultural University and Rajasthan Government, the congress had "sustainable agricultural export" as its theme. The theme was chosen in view of India's comparative advantage in the global agricultural commodities market, which can be capitalised by a long-term strategy backed by scientific research.

Addressing the Inaugural ses-



modities constitute 16 per cent of the total exports from the country, suggested that the multidimensional strategy for agriculture sector should use the knowledge about various applications of traditional plants.

He also announced that a spices research centre would soon be established in Jaipur for promoting the spice exports from Rajasthan.

The NAAS President and Director General of Indian Council of Agricultural Research, Dr. R.S. Paroda, laid stress upon a more effective linkage between the public sector research and development institutions and the private sector in the realms of information-based market intelligence, quality standards, demand oriented approach and value addition.

Other speakers in the inaugural session included the Assistant Director General of Food and Agriculture Organisation (FAO), Dr. Prem Nath; Rajasthan Agriculture Minister, Mr. Tayeb Hussain; and Vice-Chancellor of Rajasthan Agricultural University, Dr. N.R. Bhasin.

Six memorial medals were awarded to the eminent agricultural scientists for their distinguished services, while four recognition awards and five young scientists awards were given away to others on the occasion.

### **Research Centre in Apple & Peach Crops**

The World Bank-funded and Indian Council of Agricultural Research Council-sponsored Rs. 1000 crore National Agricultural Technology Project has chosen Parmar University for the establishment of a multi-crore lead centre for research in high density plantations of apple and peach crops.

The acting Vice-Chancellor of the university, Dr. R.P. Awasthi, said that the allotment of the project was in recognition of the success achieved by the scientists of the university "who had recorded three-to-four-fold improvement in crop yields of these fruits at the university's experimental farms."

While outlining his plans for the University, Dr. Awasthi said that in keeping with the Ninth Plan proposed thrust on improvement in teaching standards, teaching work would be assigned to the core faculty having extensive experience in the field. A system of external evaluation up to the extent of 50 per cent in the examinations would be introduced from the coming session in place of the present 100 per cent internal evaluation. It would be ensured that a minimum of 105 instructional days were held during a semester. An added stress would be given to practical, farm-oriented education.

Proper monitoring of students performances and their overall development would be ensured through an elaborate advisory, tutorial and welfare service that would be created soon.

Intensive research would be carried out to establish high-yielding varieties of important crops like, apple, citrus, mango and stone fruits. Control measures would be standardised for the eradication of various diseases and efforts intensified for taking the technology generated at the university laboratories to the fields.

Exotic fruits like kiwi, olive, strawberry, chestnuts and hazelnuts had been adapted to the local conditions by the university scientists. These fruits were low

volume, high value cash crops which promised high returns to growers.

Similarly exotic vegetables like asparagus, broccoli, red cabbage, brussels sprout and swiss chard had been doing very well at the university's demonstration plots as well as on the growers' fields. The university would give an added thrust to popularising these amongst farmers.

Dr. Awasthi regretted that the state had been lagging behind in fruit processing, partly for the reason of unavailability of process grade fruit in the state. At present, even the meagre fruit-processing capacity, which was a mere 6 per cent of the total fruit production, could not be fully utilised. It would be his endeavour to remedy this situation as the fruit processing industry by ensuring reasonable returns even during periods of glut held the key to the growers' prosperity.

The Vice-Chancellor also stressed the need for ending the exploitation of farmers at the hands of certain multinationals, which were selling vegetable seeds like those of tomato at prices as high as Rs. 40,000 per kg, adding that the scientists had made important breakthroughs in the production of high-yielding vegetable seeds, which could be made use of through some government or semi-government multiplication agency.

### **Award for HAU Vice-Chancellor**

The Alumni Association of the Pakistan Farm Scientists has honoured Prof. J.B. Chowdhury, Vice-Chancellor of Haryana Agricultural University (HAU), with the Mian Afzal Hussain Award for his contribution to the field of science. The award was presented to Prof.

Chowdhury by the association's secretary-general, Dr. Sayeed Ahmed, in Hisar recently.

Dr. Ahmed, who along with four other Pakistani scientists Dr. Hafi Abdul Qayyum, Dr. Rana M. Aslam Khan, Dr. Manjoor Ahmed Khan and Dr. Ijaz Rasool was present here said the award had been given to Prof. Chowdhury for his scientific acumen and lifetime achievements.

The Pakistan delegation, went around the different colleges, research farms, veterinary clinics, the university exhibition hall and library. They observed the techno-

logical innovations being achieved by HAU scientists in agriculture and allied fields and held discussions with them on topics of mutual interest.

Dr. Rana M. Aslam Khan, Professor of Horticulture in the University of Agriculture in Faisalabad, said, "We were keen since long to develop exchange programme with the farm varsities of Haryana, Punjab and Himachal Pradesh."

"We have already started sharing scientific information with the Punjab Agricultural University" he said.

## News from UGC

### Countrywide Classroom Programme

Between 22nd and 31st March, 1999 the following schedule of telecast on higher education through INSAT-1D under the auspices of the University Grants Commission will be observed. The programmes are telecast on the Doordarshan's National Network from 9.30 to 10.00 a.m. every day except on Saturdays & Sundays. These programmes are also telecast on Doordarshan's National Network from 6.00 to 6.30 a.m. two days a week i.e. on Saturdays and Sundays. On DD2 International Programme will be shown at 11.00 to 12.00 hours on Saturdays only.

Hindi Programmes are being telecast on Mondays to Fridays from 6.00 to 6.30 a.m.

**22.3.99**

"Genetics in Forest-2"

"Windmill : From Energy to Electricity"

"When the Universe was Young-1"

**23.3.99**

"Oxford of the East : Pune

University"

"Performing Arts"

**24.3.99**

"Browsing the Frontiers of Information Technology-2"

"Ray of Light — Rehabilitation of Street Children"

**25.3.99**

"Society for All Ages"

"Question Time-106"

"Silk Cotton Tree : Kapok"

**26.3.99**

"Rafting Down the Barak"

"An Ancient Indian Sport : Kho-Kho-2"

"In Search of Ethnic

Dimension : The Koyas-2"

**27.3.99**

"Paris New Delhi Video Conference-3"

"International Programmes"

**28.3.99**

"Strokes from the Past : Capt. C.T. Sarwate"

**29.3.99**

"Energy for Life"

"Oscillations"

"When the Universe was

Young-2"

**30.3.99**

"SOHO (Small Office Home Office)"

"Fine Arts : Painting"

**31.3.99**

"Browsing the Frontiers of Information Technology-3"

"Food Chain"

"The Indian Tribes"

### Hindi Telecast

प्रातः 6.00 से 6.30 बजे तक

**22.3.99**

"केशिया स्यामिया"

**23.3.99**

"काम काजी हिन्दी"

**28.3.99**

"बहुउपयोगी चन्दन"

**29.3.99**

"हिन्दी का प्रथम शोध निबन्ध-1"

**30.3.99**

"पलाश"

### Access to ISID Databases

The University Grants Commission (UGC) is reported to have recently signed an agreement with the Institute for Studies in Industrial Development, to provide free access to ISID's databases to teachers and researchers in schools and colleges via the internet.

With the spread of the Internet, a researcher in a remote area like Meghalaya, Jammu and Kashmir, Kerala, Gujarat or even abroad will have access to ISID database almost instantly and with equal ease.

The ISID's database seeks to fill the gaps in armouries of social science researchers. In addition to books, a basic requirement for all researchers and teachers is identification of relevant reading material, articles in academic journals and current debates in the press.

The data/information is being made available through INFLIBNET, with help from INSDOC, Indian Institute of Science, Bangalore, SNDT Women's University, Mumbai and M.S. University of Baroda, Vadodara. There are nearly 70,000 entries in the on-line index (OLI) of articles in social science journals and 3,85,000 entries in the Press Clippings Index (PCI) covering articles, news items, editorials and book reviews. Annual additions to the database are of the order of 5,000 and 40,000 respectively in ISID.

The database will now be available to teachers and researchers in easily retrievable form on the

Internet. The ISID is also working towards full text down-loading of its working papers and access to other materials. The website address is <http://isidev.delhi.nic.in>

The Internet address is being made available with the support of the National Informatics Centre (NIC) who have also provided internet connectivity through V-Sat and high speed RF links.

Inaugurating the website, Ms A.S. Desai, UGC Chairperson, felt the website would meet a long-standing need of social science researchers. She compared the efforts of the ISID with those of the Institute of Science in the field of sciences.

timination; (iv) Network Techniques for Scheduling; Resource Allocation; (v) Logical Framework Analysis; (vi) Design of Project and Monitoring Control Systems; (vii) Methods and Techniques of Monitoring and Evaluation; (viii) Project Evaluation & Auditing, Completion and Assimilation; (ix) Impact Assessment of different Projects; (x) Project Management Information Systems (PMIS); (xi) Post-Project Evaluation & Auditing, Project Performance Audit Report (PPAR).

Further details may be obtained from The Continuing Education Centre, Asian Institute of Technology, P.O. Box-4, Klongluang Pathumthani-12120, Thailand, Fax : (662) 516-2126, 516-1418, CEC Fax (662) 524-5247, E-mail: [cec@cs.ait.ac.th](mailto:cec@cs.ait.ac.th) (or) [harigo@ait.ac.th](mailto:harigo@ait.ac.th), Website: <http://www.cec.ait.ac.th>

## ***News from Abroad***

### **Project Monitoring & Evaluation**

Asian Institute of Technology, Bangkok proposes to organise a training course on Project Monitoring & Evaluation on 7 June - 2 July 1999.

The course aims to provide project managers with the techniques needed to implement and monitor the project in accordance with the plans and to ensure the successful hand-over of the project. The focus is on various development projects.

In addition, special emphasis will be given on irrigation, agriculture and rural development projects in terms of lectures, case studies, simulations, exercises, field visits and workshop sessions.

The course contents include (i) Project Management — An

Overview; (ii) Techniques of Project Implementation; (iii) Budgeting Methods & Cost Es-

### **REGIONAL ENGINEERING COLLEGE WARANGAL-506 004 (A.P.)**

#### **Advt. No. Estt. 1/99**

Applications in the prescribed form are invited for the following posts in the A.P. State Govt. Pay Scales on or before 12.04.1999.

- i) Registrar (Scale of Pay : 5770-9260)
- ii) Deputy Registrar (Acad.) (Pay Scale : 4400-8700)
- iii) Deputy Registrar (Admn.) (Pay Scale : 4400-8700)
- iv) Stores Officer (Pay Scale : 3640-7580)

Application forms and details of qualifications, experience etc can be had from the Principal, Regional Engineering College, Warangal-506 004 by sending Rs. 100/- in the form of Crossed Demand Draft drawn in favour of the 'Principal, Regional Engineering College, Warangal' payable at State Bank of Hyderabad, REC Branch, Warangal-506 004. The college reserves the right not to fill any post and also to shortlist the applicants to be called for interview.

**PRINCIPAL**

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## BOOK REVIEW

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### Competency, Commitment and Quality

C.S. Subba Rao\*

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Khosla, D.N., Ed. *Competency Based and Commitment Oriented Teacher Education for Quality School Education, Initiation Document*, Pp. xv+43; *In-service Education*, Pp. xv+29. New Delhi, National Council for Teacher Education, 1998.

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After publishing *The Curriculum Framework — A Discussion Paper*, the National Council for Teacher Education brought out two documents — *Initiation Document* and *In-service Education for Competency Based and Commitment Oriented Teacher Education for Quality School Education*, as a result of consultations with teacher educationists in the country in a number of seminars. Quality enhancement in teacher education is one of the major assignments before the Council for the present, in relation to the Minimum Levels of Learning (MLL), at the primary stage. These documents are intended for discussion to generate new ideas and implementation strategies. More such documents will follow in different areas of teacher education.

In an introductory note entitled "Effective Teacher Education," Prof. R.H. Dave has mentioned the following inter-related components of teacher education :

1. Pre-service and initial teacher education,
2. Recurrent in-service teacher orientation,
3. Continuing professional self-learning,
4. Professional orientation of

school principals and other educators,

5. Upgradation of higher professional education, and

6. Enrichment opportunities for teacher educators.

The first three components are directly focused on teacher education *per se* and the other three are also equally important and essential. The package of three interrelated components of professional education of teachers needs analysis for improvement and new demands and challenges for renewal of teacher education curricula. In this context five performance areas have been identified. They are :

1. Performance in the classroom,
2. School level performance,
3. Performance in out-of-school activities,
4. Performance related to parental contact and cooperation, and
5. Performance related to community contact and cooperation.

These constitute the theatres of teacher's performance, which require ten competencies so far identified.

1. contextual competencies,
2. conceptual competencies,
3. curricular and content competencies,
4. transactional competencies,
5. competencies in other education activities,
6. competencies related to

teaching-learning materials,

7. evaluation competencies,

8. management competencies,

9. competencies related to parental contact and cooperation, and

10. competencies related to community contact and cooperation.

There is no guarantee that the teacher will become a committed professional even after acquiring a high degree of proficiency in the competencies listed above. So the documents have also mentioned the following five commitment areas to form an integral and essential part of teacher education. They are :

1. commitment to the learner,
2. commitment to the society,
3. commitment to the profession,
4. commitment to achieve excellence, and
5. commitment to basic human values.

Teacher education curriculum is expected to develop the ten competencies in a teacher who will function in the five performance areas with commitment to the five beneficiaries identified in the consultations held by the National Council for Teacher Education (NCTE).

In the first document, chapters 1 to 4 deal with introduction comprising 1. The need, characteristics of a competent and committed teacher and emerging educational and societal scenario, 2. Magnitude of the task, 3. The four areas of action in pre-service, in-service and continuing education of teachers and teacher educators, and 4. The comprehensive nature of teacher education pre-service, in-service and preparation of teacher educators.

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\*Emeritus Professor of Education, Osmania University and NCERT, 12-13-67, Tar Naka, Hyderabad-500 017.

In the second document chapter 1 to 3 deal with 1. context-backdrop, NCTE's initiative and orientation of in-service teachers, 2. objectives of competency based in-service teacher education, and 3. content course. In the first document chapter 5 gives the competencies, commitments and professional performance areas, whereas in the second document chapters 4, 5, and 6 deal with competencies, commitments and performance areas. Chapter 6 in the initiation document and chapter 7 in in-service education document deal with implementation strategies.

The dilution of quality due to expansion of educational systems was responsible for the suggestion of minimum levels of learning in the National Policy on Education 1986/92 (NPE). Teacher educators and teachers have been trained in the SCERTs and DIETs under the guidance of NCERT.

Earlier the Department of Teacher Education (DTE), NCERT conducted an experimental course of postgraduate diploma in elementary teacher education drawing teacher educators from all states. After its successful try-out it was recommended to all universities for introduction as B.Ed elementary for preparation of graduate level teachers, supervisors, administrators and teacher educators at elementary level. It is easy to give the philosophical, sociological and methodological background to teacher education but so far we have not been able to produce a creatively competent, committed and innovative teacher either through our pre-service or in-service teacher education programmes except in very rare cases.

The non-statutory NCTE had done some excellent seminal work mostly confined to the improvement of standards or quality of teacher education at all levels making recommendations resulting

from the seminars it conducted as it did not have the regulatory function. While drafting the bill for NCTE both the regulatory and professional support or quality improvement functions have been included. In fact the regulatory functions pertain to the statutory NCTE, while the professional improvement function should logically belong to the DTE, NCERT. During the 20 years of non-statutory NCTE it brought out the curriculum framework in 1978 and renewed it in 1988. This activity should be continued by the DTE organising, orientation, training, extension activities in curriculum development and in-service education of teacher educators, while the NCTE should confine itself to S. 12 regulatory functions of the Act. But the section contains professional activities like surveys, research and in-service education also and the same should now focus only on evolving standards or norms for implementation under section 12 and should not stray into the in-service education, which is the legitimate field of NCERT.

In the introductory chapter of the initiation document, 8 essential characteristics of competent and committed teachers are given. These are :

1. The teacher is loved by children, appreciated by the community and endeared by the peers,
2. Modest, self-confident and partner in the nation-building process,
3. Aware of knowledge explosion, population explosion and explosion of expectations from education,
4. Knows to collect and process information,
5. Willing to renew approaches, methodology and techniques with the changing times,
6. Willing to achieve professional upgradation and communi-

cator of new developments to the community, and

#### 7. Socialising agent.

The above list of characteristics of a competent and committed teacher is certainly neither exhaustive nor actually related to the competencies and commitment areas. Perhaps NCTE may assign this task to another workshop to be conducted in future.

Objectives of competency based in-service teacher education have been given under chapter 2 of the in-service education document and in the chapter 4 of the same document an attempt has been made to spell out in detail the ten competencies, which is an improvement over the list given in the first document. The implementation strategy under chapter 7 of the second document mentions conducting of meaningful in-service education programmes based upon the competency based approach which simultaneously strives to incorporate commitments and performance areas as inseparable ingredients of each programme.

The participants in future workshops may identify relevant content areas from the available curriculum, which could be correlated with the identified competencies, listing curricular and co-curricular activities that would suggest these competencies. This requires the wording of ten competencies in the teacher behaviour language in relation to the five-commitment areas (50) and again in relation to the five-commitment areas (250). Thus the lists of teacher competency behaviours will be categorised under 250 headings viz. for each competency in relation to its corresponding commitment and performance areas.

This list of competencies thus worked out in detail correlated to the commitment and performance areas will serve the development



of a really competency based teacher education programme for different levels.

In-service education is in a very bad shape since the handing over of secondary and elementary departments of extension attached to colleges of education and teacher training institutes to the state governments, so far controlled by the Directorate of Extension Programmes in Secondary Education (DEPSE), and Department of Basic Education in the NCERT. The 1964-66 Education Commission recommended organisation of school complexes (clusters of schools) for the in-service professional growth of teachers under guidance of a superior school or college. This scheme was very enthusiastically initiated and continued for sometime. Every month elementary school teachers used to gather at a central school to watch a demonstration lesson and participate in a lecture cum discussion. These and such other extension activities have to be rejuvenated under the leadership of the colleges of education which should be given jurisdiction over a territory equally divided in a state and guided by the Department of Teacher Education and Extension, NCERT. This activity should bear in mind the dictum of the National Policy of Education, which said that in-service education should be a continuation of the pre-service education. In a one-year course of teacher education it is not possible to exhaust all aspects and dimensions of curriculum and it is necessary to apportion portions to be covered essentially in pre-service education and those to be apportioned to the in-service education.

Thus in-service teacher education should be viewed as a rhythmic, continuous, self-directed and institution based system, not essentially periodic in fits and starts.

## UNIVERSITY OF KERALA

THIRUVANANTHAPURAM-695 034

No. PRI/1660/999.

### NOTIFICATION

Applications are invited for appointment to the following posts.

Sl.No.	Department	Post	Pay Scale	Vacancy & Quota*	
1.	Bio-Chemistry	Lecturer	Rs. 2200-4000	1	Open
2.	Botany	do	do	2	1-Muslim, 1-Open
3.	Distance Education	do (Politics)	do	1	Open
4.	Mathematics	Lecturer	do	2	1-Muslim, 1-Open
5.	Sociology	do	do	2	1-SC, 1-Open
6.	Zoology	do	do	1	Open
7.	Statistics	(i) do	do	1	Open
		(ii) Reader	3700-5700	1	SC
8.	History	do	do	1	Ezhava
9.	Psychology	do	do	1	Ezhava
10.	Russian	do	do	1	Ezhava
11.	Commerce	Professor	4500-7300	1	Ezhava
12.	Library & Information Science	do	do	1	Ezhava
13.	Malayalam	do	do	1	Ezhava
14.	Physics	do	do	1	SC
15.	University Health Centre	Health Information Officer	1520-2660	1	Open
16.	Linguistics	Technical Assistant	6675-10550 (Revised Scale)	1	Ezhava (Temporary vacancy for 1 year)

\*In the case of reserved posts, if no candidate from the said communities are found suitable, applications from other reserved communities will be considered, in accordance with the communal rotation and in the absence of such suitable candidates, members of forward communities will also be considered.

AGE : (as on 1.1.1999) : PROFESSOR — Not more than 50 years; READER — not more than 45 years; LECTURER — Not more than 40 years. For posts 15 & 16 — not more than 35 years. Usual relaxation in upper age limit for SC/ST/OBC (and those already in the teaching service of the University, in the case of teaching posts).

QUALIFICATIONS : Post 1 to 14 as per UGC norms. Post 15 — General — PG degree of a recognised University. Technical : (i) 3 years experience in editing health related literature in an establishment on a full time basis. (ii) Publications (including translations), in Malayalam on health or science subjects. (iii) Experience in investigations/surveying health problems. Post 16 : I or II Class PG in Linguistics of an Indian University with 50% marks. Eligibility certificate to be produced, if degree is from other than Kerala University. Desirable : Ph.D in the concerned subject.

COST OF APPLICATION FORMS : for Post 1 to 7 (i) Rs. 150/-, Post 7(ii) to 10 Rs. 300/-, Post 11 to 14 Rs. 350/- Post 15 Rs. 20/- & Post 16 Rs. 100/-

MODE OF REMITTANCE : By D.D. drawn on SBT/SBI/Dist. Co-Op. Bank (Candidates residing outside the State may send DD drawn on any Nationalised Bank), in favour of the Finance Officer, University of Kerala, payable at Thiruvananthapuram or by pay-in-slip at the University cash counter. (Applicants who send DD should note on its reverse, their name and purpose of remittance).

APPLICATION FORMS AND MORE DETAILS can be had from the Section Officer, Forms Section, University of Kerala, Thiruvananthapuram-695 034, specifying post and enclosing DD/Pay-in-slip, towards cost of application.

**Last Date for receipt of filled in Applications : 19th April, 1999.**

Dr. G. Satharathan  
REGISTRAR

4th March, 1999

N.B. : Those who have already applied in response to earlier notifications No. PR.1/2751/16/93 dated 2.12.93 (Ad.H.(1)260/93 dt 16.11.93); N.PR.1/2151/10/97 dated 28.2.97 (Ad.H.(1)15/97 dt.21.1.97); PR.1/2151/15/97 dated 14.5.97(Ad.H.(1)18/97 dt. 17.4.97) are exempted from applying again provided they possess the required present qualification at the time of earlier submission of their applications. Additional qualifications/experience subsequently acquired, may be informed with supporting documents.

# THESES OF THE MONTH

A list of doctoral theses accepted by Indian Universities (Nov-Dec 1998)

## AGRICULTURAL AND VETERINARY SCIENCES

### Agriculture

1. Khan, Yusuf Dilnashinuz. Fungus diseases of banana fruits and their management for promotion of export. (Dr J G Raut), Department of Agriculture, Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

2. Sheikh Jilani Sheikh Kahu. Heterosis and combining ability in relation to cytoplasmic diversity in Sorghum. (Dr S B Atale), Department of Agriculture, Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

### Genetics

1. Padmavathi, Ponnuru. Monitoring the genetic, cytogenetic and biochemical effects in pesticide industry workers. (Prof P P Reddy), Department of Genetics, Osmania University, Hyderabad.

### Agronomy

1. Kataria, Naresh Kumar. In-situ organic farming studies in maize-wheat sequence under rainfed conditions. (Dr R C Thakur), Department of Agronomy, Himachal Pradesh Krishi Vishwavidyalaya, Palampur.

## BIOLOGICAL SCIENCES

### Botany

1. Chaturvedi, Alka. Comparative embryology in a few taxa of euphorbiaceae. (Dr P K Mukherjee), Department of Botany, Nagpur University, Nagpur.

2. Chaudhuri, Kaberi. Physiological and biochemical responses of two jute species to salinity stress. (Dr Manojit Acharyya Choudhuri), Department of Botany, University of Burdwan, Burdwan.

3. Jatinder Kaur. Hormonal basis of invitro direct plant regeneration and micropropagation through minitubers in potato. Department of Botany, Punjab Agricultural University, Ludhiana.

4. Saha, Deepa N C. Tolerance levels of certain tree species towards industrial air pollution. Department of Botany, Maharaja Sayajirao University of Baroda, Baroda.

5. Sanjeev Kumar. Effect of cement dust pollution on agroecosystem. (Dr D D Pandey), Department of Botany, Magadh University, Bodh Gaya.

### Cellular and Molecular Biology

1. Jagannadham, Medicharla Venkata. Adaptation of bacteria to low temperatures: the role of carotenoid pigments. Department of Cellular and Molecular Biology, Jawahar Lal Nehru University, New Delhi.

### Life Sciences

1. Abdul Jaleel K A. Mycobacterium tuberculosis antigen quantization by immunoassay and its application in tuberculo-

sis. (Dr S F B Khan), Department of Life Sciences, Jamia Millia Islamia, New Delhi

2. Padmasree, KPMSV. Biochemical basis of the importance of mitochondrial oxidative electron transport in optimizing photosynthesis in mesophyll protoplasts of pea (*Pisum sativum* L). (Prof A S Raghavendra), Department of Life Sciences, University of Hyderabad, Hyderabad.

3. Singh, Mayengbam Joychandra. Limnological studies of Pumlen lake - A major freshwater wetland of Manipur. (Prof H Tombl Singh), Department of Life Sciences, Manipur University, Imphal.

4. Sree, B Karuna. Studies on water stress-responsive proteins and enzymes in rice (*Oryza sativa* L): Identification and partial characterization of aldose reductase. (Prof A R Reddy), Department of Life Sciences, University of Hyderabad, Hyderabad.

5. Syamasundar, P V. Immunosuppression at the murine foeto-maternal interphase. (Dr Seeml Farhat Basir), Department of Life Sciences, Jamia Millia Islamia, New Delhi.

### Marine Sciences

1. Kripa V. Biology and culture of the rock oyster *saccostrea cucullata* (born). (Dr K V Mohammed Salih), Department of Marine Sciences, Cochin University of Science and Technology, Cochin.

### Zoology

1. Majumdar, Sumit Ranjan. Effects of sublethal dose of some toxic chemicals on the digestive system in Indian house sparrow, *passer domesticus indicus*. (Dr Asit Kr Sarkar), Department of Zoology, University of Burdwan, Burdwan.

2. Markandeya, V. Action of botanical pesticides and insect growth regulators on coccinellids. (Dr B Julius), Department of Zoology, Osmania University, Hyderabad.

3. Pradeep, P K. Studies on stored grain pests repellent properties of certain plant extracts on the rust red flour beetle *tribolium costaneum herbst* - (Coleoptera : Tenebrionide). Department of Zoology, Maharaja Sayajirao University of Baroda, Baroda.

4. Prasun Kanta Moitra. Developmental toxicity evaluation of uranyl acetate and methyl nitrosourea in chick embryos. (Dr Sudhansu Kumar Ghosal), Department of Zoology, University of Burdwan, Burdwan.

5. Rudra, Swapan Kumar. Comparative epidemiological studies of lymphatic filariasis between tribal and non-tribal population of Bankura district, West Bengal. (Dr Goutam Chandra), Department of Zoology, University of Burdwan, Burdwan.

6. Swamy, T Venu Gopala. A study on the genetic variations of some placental isozymes. (Dr N Sreeram Kumar), Department of Zoology, Osmania University, Hyderabad.

7. Tohiuddin, Golam. The life cycle and bio-energetics of *callosobruchus chinensis* linn. (coleoptera:bruchidae) attacking three varieties of pulse seeds. (Dr Tara Charan Bandyopadhyay), Department of Zoology, University of Burdwan, Burdwan.

8. Varalakshmi, Influence of solasodine and mesuol on the silk yield of the silk worm *Bombyx mori* L (Lepidoptera : Bombycidae). (Dr S Sabita Raja), Department of Zoology, Osmania University, Hyderabad.

## **EARTH SYSTEM SCIENCES**

### **Environmental Sciences**

1. Parwate, Arun Vishwanath. Utilization of alum sludge and recovery and reuse of alum coagulant from the sludge with reference to water treatment plant. (Dr A G Bhole), Department of Environmental Sciences, Nagpur University, Nagpur.

2. Ramachandran, Kavitha. Development of bioreactors for nitrifying sewage. (Dr I S Bright Singh), Department of Environmental Studies, Cochin University of Science and Technology, Cochin.

### **Geology**

1. Bisht, Balbir Singh. Iron-uranium association in the proterozoic dealing group rocks in Arunachal Pradesh mineralogical and geochemical studies and controls. (Dr Pavanagum and Dr M A Ali), Department of Geology, Osmania University, Hyderabad.

2. Maurya, Deepak Maya Ram Singh. Quaternary tectonics : Evidences from Gujrati alluvial plains. Department of Geology, Maharaja Sayajirao University of Baroda, Vadodara.

3. Sunil S R. Modelling of stream aquifer interaction along Tambraparni river, Tamilnadu. (Dr Balasubramanian A), Department of Geology, University of Mysore, Mysore.

## **ENGINEERING SCIENCES**

### **Civil Engineering**

1. Fard Ahmad Fakheri. Regionalisation of flood extremes using pattern analysis. (Dr B P Parida), Department of Civil Engineering, Indian Institute of Technology, New Delhi.

2. Gupta, Smarajit Sen. Influence of geological structures on in-situ stresses. (Prof T Ramamurthy), Department of Civil Engineering, Indian Institute of Technology, New Delhi.

3. Singh, Sarbjit Active control of buildings under seismic excitation. (Prof T K Datta), Department of Civil Engineering, Indian Institute of Technology, New Delhi.

### **Electrical Engineering**

1. Rajagopal K R. Analysis and design of hybrid stepper motor and torquer used in space application. (Dr Bhim Singh and Prof B P Singh), Department of Electrical Engineering, Indian Institute of Technology, New Delhi.

### **Electronics Engineering**

1. Sivannarayana, N. Characterization of transient-like signals using wavelet transforms. (Prof D C Reddy), Department of Electronics Engineering, Osmania University, Hyderabad.

### **Mechanical Engineering**

1. Chowdary, Boppana Veeraiah. Flexibility and related issues in evaluation and selection of manufacturing systems. (Prof Arun Kanda and Prof K S P Rao), Department of Mechanical Engineering, Indian Institute of Technology, New Delhi.

2. Sharma, S C. Development of copper alloys/SIC particulate metal matrix composites. Department of Mechanical Engineering, University of Mysore, Mysore.

## **MATHEMATICAL SCIENCES**

### **Mathematics**

1. Banerjee, Santwana. Some problems of wave propagation in elastic, generalised magneto-thermo-elastic and thermo-viscoelastic solids. (Dr Snehanishu Kumar), Department of Mathematics, University of Burdwan, Burdwan.

2. Kar, Sujit Kumar. A lle theoretic study of certain generating functions of laguerre polynomials, modified Jhlolu polynomials and some others. (Dr D K Basu and Dr Mahima Ranjan Adhikari), Department of Mathematics, University of Burdwan, Burdwan.

3. Madwarao, Hombali Chhaya. Nevanlinna theory-exceptional values, fix points. (Dr S S Bhoosnurmath), Department of Mathematics, Karnatak University, Dharwad.

4. Mukherjee, Ujjal Kumar. F - fuzzy proximities (Dr S K Samanta and Dr Kshitish Chandra Chattopadhyay), Department of Mathematics, University of Burdwan, Burdwan.

5. Mukhopadhyay, Amal Kumar. On work of some eminent Indian mathematicians. (Dr Mahima Ranjan), Department of Mathematics, University of Burdwan, Burdwan.

6. Pal, Debabrata. Partial difference equation and a class of inventory queues. (Prof A K Chaudhuri and Dr Rathindra Nath), Department of Mathematics, University of Burdwan, Burdwan.

7. Rao, H S Govinda. Integration of polynomials over N-dimensional linear polyhedra. (Dr H T Rathod), Department of Mathematics, Bangalore University, Bangalore.

### **Statistics**

1. Prasanta Kr Jana. Some aspects of reliability determination under stress strength models. (Dr Dilip Roy), Department of Business Administration, University of Burdwan, Burdwan.

## **MEDICAL SCIENCES**

1. Das, Sanjib Kumar. Characterization of tumor infiltrating lymphocytes in murine sarcoma and their role in curbing malignancy. (Dr A K Chakraborty), Centre for life Sciences, University of North Bengal, Distt Darjeeling, West Bengal.

### **Neurophysiology**

1. Munirathinam, S Regeneration of Olfactory tract following experimentally produced lesion in neonatal rat - A behavioral, morphological, biochemical and ultrastructural study. (Dr T R Raju), Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences, Bangalore.

### **Pharmacology**

1. Naresh Kumar. Influence of dietary fluids on

pharmacokinetics and bioavailability of antiepileptic drugs. Department of Pharmacology, Postgraduate Institute of Medical Education and Research, Chandigarh.

#### Pharmacy

1. Doshi, Chetan Chhabildas Design of controlled release drug delivery system. Department of Pharmacy, Maharaja Sayajirao University of Baroda, Baroda.

### PHYSICAL SCIENCES

#### Biochemistry

1. Began G. Biochemical studies on phospholipids from soyabean (glycine max). (Dr Appu Rao A G), Department of Biochemistry, University of Mysore, Mysore.

#### Chemistry

1. Chetana P R. Spectral and thermal studies on metal complexes. (Dr P G Ramappa), Department of Chemistry, University of Mysore, Mysore.

2. Chowdhury, Shantanu. Organocobalt mediated organic synthesis: Radical approach towards carbon heteroatom bond formation. (Dr Sujit Roy), Department of Chemistry, Osmania University, Hyderabad.

3. Jadhav, Vasudev. Studies in enantio selective hydrolytic reactions of lipase from rice bran. (Dr N W Fadnavis), Department of Chemistry, Osmania University, Hyderabad.

4. Mohapatra, Suchismita. Development of new methodologies towards the total synthesis of some enzyme inhibitors. (Dr J S Yadav), Department of Chemistry, Osmania University, Hyderabad.

5. Mohd Afzal, Storage stability studies on some pesticides and their formulations under Indian climatic conditions. (Prof Mukhtar Ahmad Khan), Department of Chemistry, Jamia Millia Islamia, New Delhi.

6. Mukhopadhyay, Banani. Liquid - Liquid extraction and separation of carrier free radionuclides of second transition metals produced by nuclear activation techniques. (Dr Sushanta Kr Lahiri), Department of Chemistry, University of Burdwan, Burdwan.

7. Murthy Srinivasa K C. New spectro photometric methods for the assay of some class of drugs of pharmaceutical interest. (Dr Nagaraja P), Department of Chemistry, University of Mysore, Mysore.

8. Nashiket, Nemade Pravin. Physical and biochemical studies of industrial wastes and development of new methods with special reference to ionic moieties. (Dr V S Shrivastava), Department of Chemistry, North Maharashtra University, Jalgaon.

9. Pal, Vasanthkumar. Studies on the redox reactions of low valent vanadium species in solutions. (Prof P Vasudeva Nayak), Department of Chemistry, Kuvempu University, Shimoga.

10. Reddy, A Narayana. Synthesis and evaluation of new non-steroidal anti-inflammatory agents. (Prof V Malla Reddy), Department of Chemistry, Kakatiya University, Warangal.

11. Roy, Subho. Studies directed towards the total synthesis of potent anti HIV agent batzelladine-B. (Dr A V Rama Rao), Department of Chemistry, Osmania University, Hyderabad.

12. Shah, Manish Krishnavadan. Studies on solution

properties of metal complexes of N,O, donors. (Dr S B Mehta), Department of Chemistry, Bhavnagar University, Bhavnagar.

13. Varghese Binsy V. Acid base surface electron donating and catalytic properties of some binary mixed oxides containing rare earth elements. (Dr S Sugunan), Department of Chemistry, Cochin University of Science and Technology, Cochin.

14. Veeraiiah M K Kinetics and mechanism of oxidation of amines and aminoacids with n-metallo-n-arylhalosulphonamides (Dr Anandamurthy A S), Department of Chemistry, University of Mysore, Mysore.

#### Physics

1. Bhat, Suresh Kumar Padmanabha. Dynamic laser light scattering studies of turbulence in fluids and its drag reduction. (Prof S Chopra), Department of Physics, Indian Institute of Technology, New Delhi.

2. Govindan, Anil. Studies of structural and electro mechanical properties of europium, gadolinium and ytterbium modified PZT ceramics for transducer applications. (Prof T C Goel and Prof P K C Pillai), Department of Physics, Indian Institute of Technology, New Delhi.

3. Husain, Mohd Mudassir. Laser-induced fluorescence, optical absorption and theoretical studies of condensed ring aromatics of astrophysical interest. (Prof Z H Khan), Department of Physics, Jamia Millia Islamia, New Delhi.

4. Mehra, Anupama. Quantization of relativistic fields with fractional spin in 2+1 dimensions. (Prof Pankaj Sharan), Department of Physics, Jamia Millia Islamia, New Delhi.

5. Mohd Ilyas, Electrical dielectric and optical studies of glassy semiconducting alloys. (Dr Mushahid Husain), Department of Physics, Jamia Millia Islamia, New Delhi.

6. Pande, Sunil Madhukar. Conduction mechanism in ISO and aliovalent cations doped AG2 SO4. (Prof K Singh and Prof G N Navneeth), Department of Physics, Nagpur University, Nagpur.

7. Pattar, R T. Spectroscopic study of some polyatomic molecules. (Dr V G Tulagiri), Department of Physics, Karnatak University, Dharwad.

8. Ramachandra P. Positron annihilation spectroscopic study of poly (Chlorotrifluoroethylene) under the influence of compression, elongation and aging. (Dr Ranganathaiah C) Department of Physics, University of Mysore, Mysore.

9. Rastogi, Vipul. Studies on planar segmented waveguides and parametric amplification in the cerenkov-idler configuration. (Dr M R Shenoy and Prof A K Ghatak), Department of Physics, Indian Institute of Technology, New Delhi.

10. Saxena, Nidhi. Microwave studies of ferrites at high power levels and its substrate application in microstrip devices. (Prof Z H Zaidi and Prof G P Srivastava), Department of Physics, Jamia Millia Islamia, New Delhi.

11. Swapan.Kumar. High frequency absorptions, double relaxation times, dipole moments and molecular structures of some nonspherical polar and isotopomer molecules. (Dr A S Acharyya), University of North Bengal, Distt Darjeeling, West Bengal.



## Medical Teachers Wanted Immediately for NEPAL MEDICAL COLLEGE

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- (a) Should have postgraduate degree or equivalent qualification in the respective subject together with teaching/working experience of three years as Associate professor or equivalent post, and
- (b) Should have two original research and two original articles published in national/international journals as the main author at the level of Associate Professor.

#### 2. Associate Professor :

- (a) Should have postgraduate degree or equivalent qualification in the respective subject together with teaching/working experience of four years as Assistant Professor or equivalent post, or seven years of teaching/working experience as Lecture or equivalent post and, (b) Should have minimum of two original research as main author and two other publications as main/co-author in national/international scientific journal at the level of Assistant Professor.

#### 3. Assistant Professor :

- (a) Should have postgraduate degree or equivalent qualification in the respective subject together with teaching/working experience of three years as Lecturer or equivalent posts, and (b) Should have two original publications as the main author in national/international scientific journal.

#### 4. Lecturer :

Should have postgraduate degree or equivalent qualification in the respective subject.

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CSIR is seeking to appoint a Director for its Central Mining Research Institute (CMRI), situated at Dhanbad in the coal belt of India. Its R&D activities are development of mining methods and mine environment and safety; development of mine machinery equipment and instruments and underground space technology. The Institute has two field centres at Nagpur and at Roorkee.

The Institute has an annual budget about Rs. 800 lakhs and S&T staff of approximately 450 out of which about 125 are scientists.

The Director serves as the Chief Executive of the Institute and would be responsible among others for :

- Developing and managing a perspective plan for the Institute;
- Providing scientific leadership to the diverse R&D groups;
- Day-to-day operations of the Instt. and man-management;
- Promoting inter-laboratory and inter-agency R&D programmes and mission;
- Negotiating and acquiring R&D grants/contracts;
- Ensuring linkages with user agencies, including universities and industries; and
- marketing the knowledge-base of the Institute.

The candidate for the post must be a creative, innovative and well-established scientist/technologist of distinction and should be preferably around 50 years of age. He should have a broad scientific and technical vision, a demonstrated ability to create an environment conducive to nurturing of high class research and development, a proven record of inter-personal skills and an ability to communicate effectively.

This is a contractual appointment for a period of six years or superannuation whichever is earlier, in the scale of Rs. 5900-200-7300 (under revision) plus allowances as admissible to Council officials. Contract can be extended for another term in exceptional cases. Consultancy is permitted without any ceiling on the annual consultancy remuneration. Residential accommodation would be provided as per rules on payment of prescribed licence fee.

Nomination for the post should reach to the Director General, Council of Scientific & Industrial Research, Anusandhan Bhavan, Rafi Marg, New Delhi, 110 001. Fax 011-3710618, E-mail: dgcsir@csirhq.res.nic.in by 15 April, 1999.



# INDIAN INSTITUTE OF TECHNOLOGY : DELHI

HAUZ KHAS, NEW DELHI-110 016

## ADMISSION TO POST GRADUATE/Ph.D. PROGRAMMES 1999-2000

**1. Ph.D. : Depts. :** App. Mech., Biochem. Eng. & Biotech., Chem. Eng., Chemistry, Civil Eng., Comp. Sc. & Eng., Elect. Eng., Hum. & Soc. Sc., Management Studies, Maths., Mech. Eng., Physics, Text. Tech. :

**Centres :** App. Res. in Electronics., Atmos. Sc., Biomedical Eng., Energy Studies, Ind. Tribology, Machine Dynamics & Maint. Eng., Instr. Design & Dev., Polymer Sc. & Eng., Rural Dev. & Tech.

**Inter Disciplinary :** Appl. Sys. Res., Enter. Dev., Opto-Electro. & Opti. Commun.

**2. M.Tech. : Depts :** App. Mech. : (1) App. Mech., (2) Design Eng., Chem. Eng. : (1) Process Engg. & Design, Chemistry : (1) Modern Methods of Chem. Analysis, Civil : (1) Build. Sc. & Constr. Managmt., (2) Envir. Eng., (3) Rock Mech., (4) Soil Mech. & Found. Eng., (5) Stru. Eng., (6) Water Resources, Comp. Sc. & Eng. : (1) Comp. Sc. & Eng., Elect. Eng. : (1) Commun. & Radar, (2) Comp. Tech., (3) Control & Instr., (4) Integ. Electro. & Circuits, (5) Power Electro., Elect. M/Cs & Drives, (6) Power Sys., Mech. Eng. : (1) Design of Mech. Equipt., (2) Industrial, (3) Production, (4) Thermal, Physics : (1) App. Optics, (2) Solid State Materials, Text. Tech. : (1) Fibre Sc. & Tech., (2) Text. Eng.

**Interdisciplinary M.Tech. :** (1) Comp. Appli., (2) Energy, (3) Ind. Tribology, (4) Instr. Tech., (5) Opto-Electro. & Optical Commun., (6) Polymer Sc. & Tech., (7) VLSI Design Tools & Tech.

**3. M.S. (Res.) :** (1) App. Mech., (2) Chem. Engg., (3) Biochem. Eng. & Biotech., (4) Comp. Sc. & Eng., (5) Elect. Eng., (6) Mech. Eng. (7) Civil Engg.

(Admission to Ph.D./M. Tech & MS(R) can be on full time and part time basis, depending upon availability of seats in full time/part time).

**4. M. Des. (4 Sem., Full time only) :** Indl. Design

**5. M.Sc. (4 Sem., Full time only) :** Chemistry, Maths, Physics

Financial Assistance available for full-time Ph.D./M.Tech./M.Des./M.S. (Res.) Students. 50% to 75% tuition fee waiver for full time Ph.D scholars (except self financing scholars) and part-time Ph.D scholars belonging to Govt. organisations/institutions.

**Eligibility :** A CGPA of 6.75 (6.25 for SC/ST) on a 10 point scale or equivalent or 60% marks (55% for SC/ST) in aggregate (of all the years/semesters of the qualifying examination). A relaxation in CGPA/marks to 6.25 (55%) is also available to those with MA degree in English, for admission to Ph.D. in English). For admission to Full-time Ph.D/M.Tech./M.S(R) programme, the GATE percentile of a candidate wherever required should not be lower than the minimum prescribed viz. 75 percentile for General and 50 percentile for SC/ST Candidate(s). For details please refer to Information Brochure.

### Direct Admission to M.Tech./M.S.(R) Programme :

Depending upon decision of the individual Deptts./Centres some seats can be filled by self-supporting candidates fulfilling the admission criteria without test/interview. For details please refer to Information Brochure.

**For Application Forms & Information Brochure :** Send a crossed Draft of Rs. 300.00 (Rs. 150.00 for SC/ST) in favour of Registrar, IIT Delhi payable at SBI, IIT Delhi, and a self addressed envelope (25 cm x 20 cm) with postage stamps for Rs. 12/- and superscribed "Application for Admission to ..... prog. to Asstt. Registrar (PGS), IIT, Delhi-110 016. Forms can also be had personally against Bank Draft from Room No. AD-225/AD-229 or from SBI, IIT, Delhi on cash payment of Rs. 305 (Rs. 155/- for SC/ST). Separate form should be submitted for each Deptt./Centre/Interdis. Prog.

Issue of Form commences on	: 17.3.1999
Last date for issue of form by post	: 16.4.1999
In person	: 23.4.1999
Last date for receipt of completed form	: 23.4.1999

# CLASSIFIED ADVERTISEMENTS



## INTER UNIVERSITY CONSORTIUM for DAE Facilities

University Campus, Khandwa Road,  
Indore-452 017 (M.P.)

(Advertisement No. 1/99)

Inter University Consortium for DAE Facilities (IUC-DAEF) is an autonomous institution established by the UGC, New Delhi with headquarters at Indore and Centres at Indore, Mumbai and Calcutta. IUC coordinates research/projects from scientists from all Indian Universities on major facilities like Dhruva reactor, Variable Energy Cyclotron, INDUS-I etc created by Department of Atomic Energy and in addition maintains supplementary research facilities at these centres. Indore and Mumbai centres have supporting equipment and other research facilities like ESCA, XRD, EXAFS, SAXS and facilities for studying magnetic, dielectric and transport properties at low temperatures.

Applications are invited for the following positions in this Institution :

a) **SCIENTIST-D** : One post (Indore)

Pay Scale : Rs. 10,000-325-15,200

Maximum Age : 40 years as on 1.1.1999

**Minimum Qualification & Experience :**  
M.Sc. with experience of 5 years or Ph.D. in the field of Solid State Physics/Material Science using scattering techniques.

b) **ENGINEER-D (Cryogenics)** : One post (Indore)

Pay Scale : Rs. 10,000-325-15,200

Maximum Age : 40 years as on 1.1.1999

**Minimum Qualification & Experience :**  
M.Sc. or B.E./B.Tech or M.Tech with experience of 5 years or 4 years or 2 years respectively or Ph.D. in the field of cryogenics and/or low temperature Physics. Experience of working in airconditioning units will not be relevant.

Lower scale of Rs. 8,000-275-13,500 may be offered if suitable candidate is not found for the scale of Rs. 10,000-15,200/-.

c) **JUNIOR ENGINEER** : [Two posts (1 at Indore (Reserved for SC/ST) and 1 at Mumbai)]

Pay Scale : (i) Rs. 5,000-150-8,000, (ii) Rs. 5,500-175-9,000, (iii) Rs. 6,500-200-10,500

Maximum Age : 30 years as on 1.1.1999

**Minimum Qualification & Experience :** B.Sc. (min. 60% marks) with Physics as a major subject or Diploma (Mechanical) with minimum 60% marks.

Experience of working in Physics Laboratory specially in the field of low temperature/cryogenics/computer automation is desirable.

Depending on experience, the candidate may be placed in one of the above pay scales.

d) **ADMINISTRATIVE OFFICER** : One post (Indore Centre)

Pay Scale : Rs. 8,000-275-13,500

Maximum Age : 40 years as on 1.1.1999

**Minimum Qualification & Experience :** Master's degree with 55% marks with 5 years experience. OR

Bachelor's degree from a recognised university with atleast second class and a pass at the final examination of Institute of Chartered Accountants or a pass in SAS examination conducted by Comptroller and Auditor General of India or equivalent thereof with 5 years experience. OR

Bachelor's degree from a recognised university with second class and 10 years experience in related field.

The experience should be related to general administration/personnel/purchase & stores/finance & accounts in Govt./University/Autonomous Body/Public or Private undertaking.

e) **ASSISTANT (Accounts, Administration, Stores)** : One post (Indore)

Pay Scale : Rs. 4,000-100-6,000

Maximum Age : 35 years as on 1.1.1999

**Minimum Qualification & Experience :**  
Higher Secondary with 8 years of working experience or B.Com./B.A. with 4 years of working experience in an Administrative Office. Working knowledge of English, Word Processing & Computer Applications is essential.

f) **STENO-CLERK** : Two posts (1 at Indore (Reserved for SC/ST) and 1 at Mumbai)

Pay Scale : Rs. 4,000-100-6,000

Maximum Age : 25 years as on 1.1.1999

**Minimum Qualification & Experience :**  
Metric or equivalent with a minimum speed of 100 w.p.m. in Shorthand and 40 w.p.m. in typing, 3 years experience as Stenographer in University/Government/Autonomous Body/reputed private firm.

Experience in computer operation/data logging desirable. Candidate proficient in Hindi Shorthand and typing will be given preference.

g) **ATTENDANT/AUXILIARY STAFF-I** : Two posts (1 at Indore and 1 at Mumbai (Reserved for SC/ST))

Pay Scale : Rs. 2,550-55-2,660-60-3,200

Maximum Age : 25 years as on 1.1.1999

**Minimum Qualification & Experience :** 8th class pass with 3 years experience.

**Notes :**

1. All these posts are transferable among the Centres of this Organisation.
2. Provision for employing and giving relaxa-

tion in age to SC/ST/OBC candidates as per Govt. policy.

3. Age relaxation to candidates working in this Industry/Govt. departments may be considered.

4. In addition to Basic Pay, other allowances like Dearness Allowance, H.R.A., C.C.A. etc will be given as per rules of this Institution which are, in general, similar to the Rules for employees of Govt. of India.

5. IUC-DAEF reserves the right to appoint a candidate on a lower post in case suitable candidate is not found for a given post.

**How to apply :**

Applications giving complete bio-data typed, strictly in the following sequence of information, on plain paper in duplicate along with copies of Degrees and Experience Certificate, 2 photos attested by self (one is to be pasted on the application) and Crossed Demand Draft of Rs. 50/- payable to 'IUC-DAEF' at Indore must reach Administrative Officer, Inter University Consortium, University Campus, Khandwa Road, Indore-452 017 on or before 16.04.1999 :

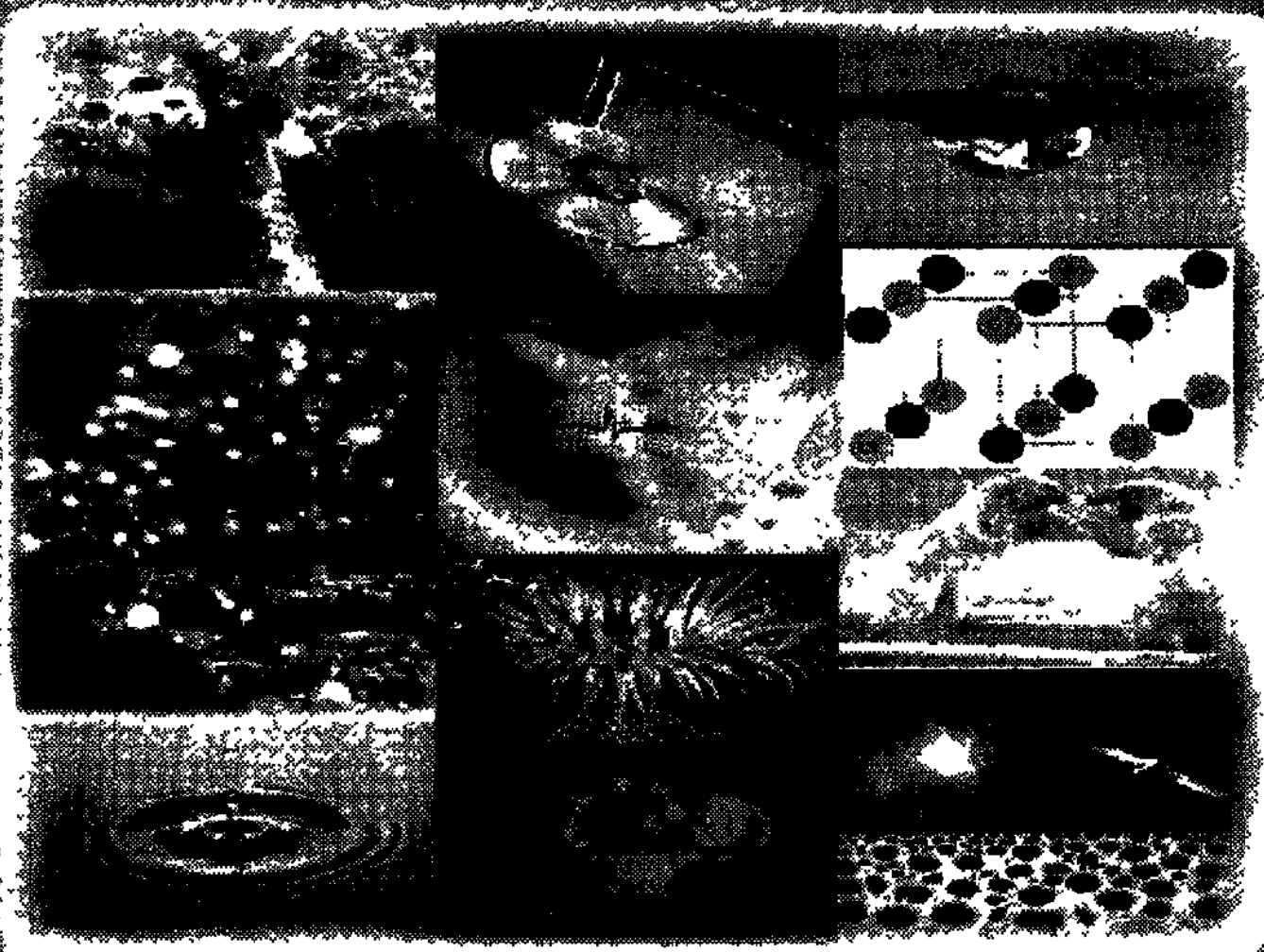
1. Post applied for 2. Name 3. Father's Name 4. Permanent & present postal address 5. Date of Birth 6. Age as on 01.01.99 (Years—Months—Days) 7. Whether SC/ST/OBC/PH/ Ex. Ser./General 8. Educational Qualifications (commencing from SSLC or Secondary level) giving details of Board, Year, Subjects, percentage of marks, division/grade 9. Technical/Professional Qualifications giving aforesaid details 10. Experience as an employee giving details in separate col. about name of the employer, designation, pay scales & gross emoluments, Period (Years—Months—Days), Nature of Duties 11. Any other relevant information 12. Details of Demand Draft 13. Dated Signature. The applicant for the post of Scientist should give details also about (1) Research Experience giving details as under 10, Field and about the papers published & presented (2) name & address of two referees under whom the person has worked.

No application money is to be paid by SC/ST candidates provided proof of the same is submitted along with the application. The envelope containing application should be superimposed 'Application for post of ...'. Candidates already in service should apply through proper channel. If there are large number of applications, we reserve our right to call only limited number of persons for test/interview.

Applications lacking in any of the requirements and applications received late shall not be entertained. Only Demand Drafts will be accepted. Canvassing in any form will be a disqualification. Applicants short listed for test/interview will be informed at appropriate time. No other correspondence/query will be entertained.

**ADMINISTRATIVE OFFICER**





## VIPRIS CLIPSET

Vigyan Prasar, (VP) an autonomous organisation under the Department of Science & Technology, Government of India has been set up to take-up large scale science popularisation activities. Vigyan Prasar's major objectives are to inculcate scientific temper, to increase the knowledge, awareness and interest about science and technology among all segments of the society. To achieve these, VP has a number of programmes like publications, information system, audio-visual productions, science clubs networks, electronic kits and so on.

**VIPRIS Clipset** is a subscription based fortnightly service, from Vigyan Prasar.

Clipset is a compilation of select clippings of news items and feature articles on science, technology and environment topics collected from more than one hundred newspapers and newsmagazines.

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Special issues on focussed topics are also brought out from time to time. A special issue on **Nuclear Tests** covering all the issues, news related to the Pokhran tests was brought out after the test conducted in May 1998.

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## INSTITUTE FOR DEVELOPMENT AND RESEARCH IN BANKING TECHNOLOGY, HYDERABAD

(Established by Reserve Bank of India)

### FACULTY POSITIONS & RESEARCH FELLOWS (Ph.D. Program)

The Institute for Development and Research in Banking Technology located at Hyderabad has been established by Reserve Bank of India with the objective to undertake the highest quality of Research, Development, Training and Consultancy in Banking Technology.

IDRBT is in the process of installing VSAT based Closed user Group network of Banking and Financial Sector, which will be operationalised in the first quarter of 1999.

The Institute is working on a number of research projects in the area of Electronic Payment systems, Security, Standards, Certification, Data Ware-housing, Multi-media products etc. IDRBT is collaborating with the University of Hyderabad to conduct Doctoral Programme and jointly conduct research and advanced education and training programmes in the area of Banking Technology and also allow MCA/M.Tech. projects to be carried out at the Institute in the area of banking technology.

The Institute has completed Academic complex with excellent facilities of Library, Conference Hall, Lecture-Hall, Computer and Multi-media labs, Campus-wide network, Computer resources, etc. and Executive Facility Centre which has executive rooms, visiting faculty accommodation, Research Fellow rooms, VIP Suites, executive lounge and a full-fledged recreation/relaxation centre with all modern facilities.

#### FACULTY POSITIONS

IDRBT invites application for posts of Faculty, Visiting Faculty and Faculty on deputation to guide and undertake the development, research and training activities. **Qualification and experience**, Ph.D. in Computer Science or closely related area with a very good academic record and relevant experience. Outstanding candidates with Post Graduation in Computer Science and relevant experience will also be considered. The Institute will also consider Professional Bankers with relevant experience and qualification for deputation to the Institute.

**Remuneration :** The salary scales of the faculty member are equivalent to those in IITs/IIMs. In addition, the Institute provides liberal perquisites such as medical facilities, vehicle loan, housing loan, leased accommodation, conveyance allowance etc., and other regular benefits. Faculty members are also entitled to accept **CONSULTANCY ASSIGNMENT** as per the rules of the Institute. Visiting Faculty will be provided furnished accommodation (less than a year) and an attractive pay package.

*Applications giving full particulars about age, qualifications, details of experience, etc., must be sent within one month to the address given below.*

#### RESEARCH FELLOWS/DOCTORAL PROGRAMME

The University of Hyderabad has recognised the Institute as a centre for guiding Ph.D. students under the external category. The Institute proposes to select up to five Research Fellows in collaboration with University of Hyderabad. Research fellows will work in the area of Banking Technology at the Institute. IDRBT will be awarding Rs. 8,000/9,000/10,000/- fellowship per month to selected candidates in the first/second/third year. Research Fellows will be involved in the research activities related with banking technology at the Institute. They will also get simultaneously registered for Ph.D. program at the University of Hyderabad. The Institute will provide single room accommodation facilities to the Research fellows on a chargeable basis. Minimum qualification for research fellows — Post Graduate degree in Computer Science or closely related area with minimum 55% marks or first class B.Tech/B.E. in Computer Science or Computer Engineering. Candidates appearing in final examination in 1998-99 can also apply.

Applications giving full particulars about age, qualifications, experience etc. and superscribing on the envelope "Research Fellowship" may be sent to the address given below. Shortlisted candidates will be supplied University of Hyderabad's prospectus and application form for consideration for the Ph.D. programme.

*Address for communication :*

The Director,  
INSTITUTE FOR DEVELOPMENT AND RESEARCH IN BANKING TECHNOLOGY,  
IDRBT, Castle Hills, Road No. 1, Masab Tank, Hyderabad-500 057 India  
Fax : 3535157, E-mail:vpgulati@idrbt.ernet.in